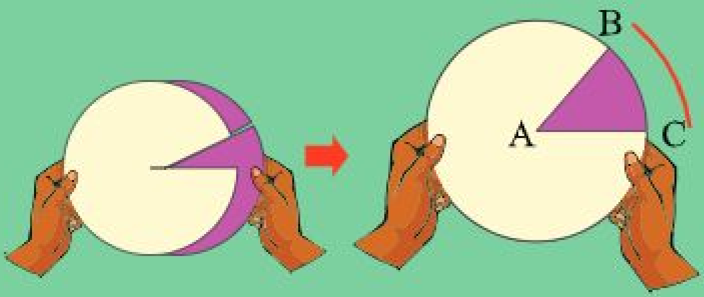
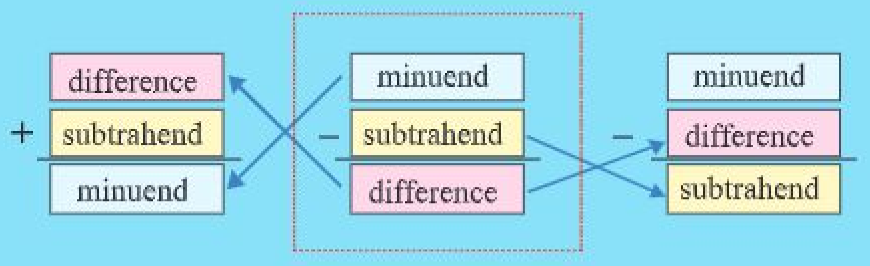
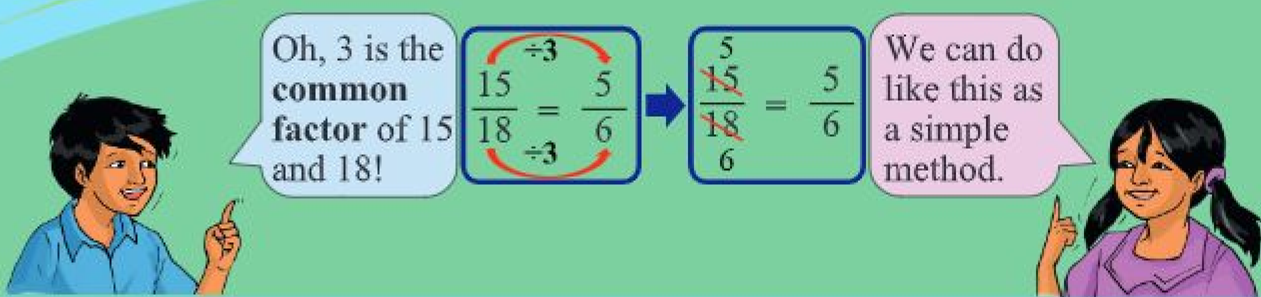
Elementary Mathematics

Class Four









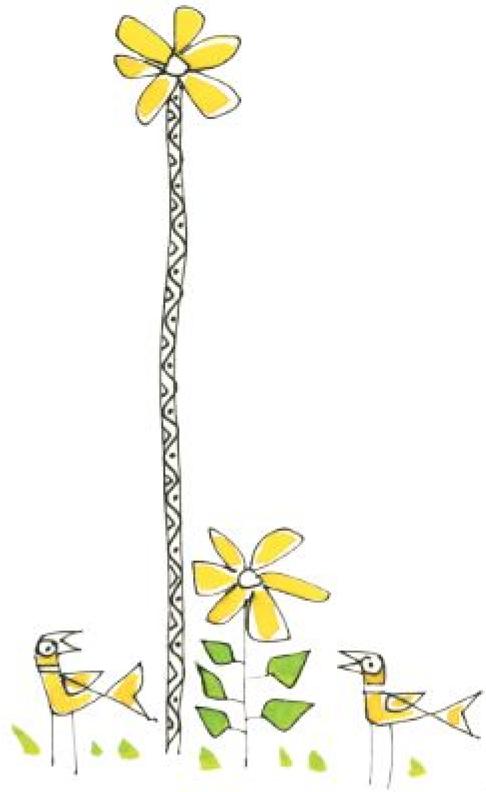
National Curriculum and Textbook Board, Bangladesh

Prescribed by the National Curriculum and Textbook Board as a textbook for class four from the academic year 2013

Elementary Mathematics

Class Four

Revised for the academic year 2025



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Preface

Primary level constructs the foundation of education. A set of well-defined targets and properly planned primary education provide strengths to the entire education system. Keeping this in mind, the primary level has been given supreme importance in the Education Policy 2010. Increasing the span and inclusiveness of the primary level, as the developed countries of the world, have been emphasised. Special attention has been given to ensure that no child's access to education is hindered by social and economic status, religion, ethnicity, or gender identity.

The National Curriculum and Textbook Board (NCTB) has implemented an integrated curriculum to update primary education. While this curriculum trails the pedagogy and the curriculum of developed countries, it also adopts traditional teaching-learning values of Bangladesh at the same time. This has enabled the education to be more life-oriented and productive. In the context of globalisation, the mental health of the children has also been specially considered in this curriculum.

Textbook is the most important component of curriculum implementation. NCTB has always borne that in mind while designing textbooks for all levels and classes including primary level. Curriculum goals and objectives have been prioritised in the writing and editing of each book. A keen eye has been kept on the diverse curiosity and capacity of the child's mind. Special importance has been given in designing the curriculum and the textbooks to make teaching-learning interactive and enjoyable. It is hoped that each book will help in the balanced psycho-physical development of children through educational activities. It will support in acquiring the required skills, adaptability, patriotism and moral values at the same time.

Elementary mathematics is a compulsory subject. Explanation, examples and pictures are used to present the content in an easy and simple way for the children. The "Let us do" activities have been incorporated along with examples to create interest among learners and make learning easier. Moreover, the contents of the textbook have been rearranged following the order of easy to hard. There is enough scope for practice in this textbook.

Special thanks to the specialists and teachers who worked intensively in writing, editing and revising the textbook. Thanks to those also who have made the textbook attractive to children through its design and illustration. This textbook, written under the curriculum 2012, has been revised to address the need in the changed context of 2024. Due to time constraints, some errors may still exist. Any constructive advice and guidance from the audience will be considered with due importance.

At the end, I wish every success of the learners for whom the book has been produced.

October 2024

Professor Dr. A K M Reazul Hassan
Chairman
National Curriculum & Textbook Board, Bangladesh

Explanation of Characters and Symbols:

1) Character: A dialogue between two students named Reza and Meena is shown in the textbook. The mathematical concept of the students would be clear through their discussion and opinion.





2) The steps have been indicated by using some symbols in the lesson.



Key Question: Key concept of the chapter has been expressed through this question.



Activity: To solve a problem students will discuss and think logically with the help of teacher.



Exercise: Students will solve the problems. Progress of learning can also be assessed.

Contents

Chapter One

Large Numbers and Place Value

How do we count, read and write large numbers?

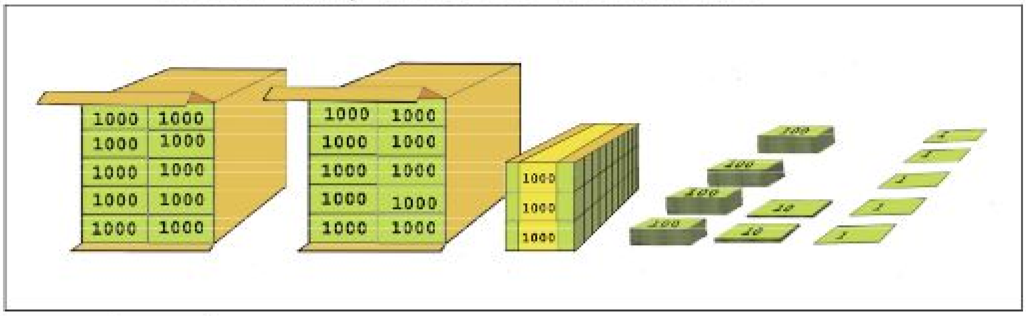
Let’s think how we count large number.

Why don’t we make groups of ten, hundred and thousand as we learned in Grade 2 and 3?

1.1 Five digit numbers

These are tickets to sell for a cricket match.

1. How many packages does the box have inside?
2. How many tickets are there in total?



1000	1000
1000	1000
1000	1000
1000	1000
1000	1000

= 10000 ten thousand.

The box has 10 packages of 1000. It means the box has ‘10 times 1000’ tickets. This amount is called **ten thousand** and is written as **10000**. There are 2 ten thousands, so it is called **twenty thousand**.

And we have 3425 more tickets, so the total is…

The total is: **23425**



And this new place is called **ayut**.

Name of the Place	ayuts	thousands	hundreds	tens	ones
	10000 10000	1000 1000 1000	100 100 100 100	10 10	1 1 1 1 1
	2	**3**	**4**	**2**	**5**
	twenty-three thousand		four hundred	twenty-five	

We read **23425**as:

'twenty tree thousand four hundred and twenty five.'

2 3 4 2 5

5 ones — 5
2 tens — 20
4 hundreds — 400
3 thousands, 2 ayut — 23 thousands — 3000, 20000

1 Read aloud, write in words and show place value like above.

(1) 23517 (2) 50326 (3) 93005

This is an example :

31024 'Thirty one thousand and twenty four'

3 1 0 2 4

4 ones — 4
2 tens — 20
0 hundreds — 0
1 thousands, 3 ayuts — 31 thousands — 1000, 30000

2 Write in figures.

(1) fifty seven thousand three hundred and sixty three
(2) thirty thousand six hundred and five
(3) eighty six thousand and two
(4) the number made of 4 ten thousands and 9 thousands
(5) the number made of 6 ten thousands, 7 thousands and 5 tens

1.2 Six, Seven and Eight digit numbers

137109



This is the number of a newly registered motor vehicle in Bangladesh in 2013. How do you read it?

It's easy! Let's make groups of ten, hundred thousand and ten thousand as we did before.

Wait! I don't think it's so easy... because there aren't enough places.

ayuts	thousands	hundreds	tens	ones
3	7	1	0	9

You need to know a new place named **lacs**.
1 **lac** is **10 ayut** and written as **100000**

Name of the Place	lacs	ayuts	thousands	hundreds	tens	ones
	1	**3**	**7**	**1**	**0**	**9**
	one lac	thirty seven thousand		one hundred	nine	

We read **137109** as:
'one lac thirty-seven thousand one hundred and nine.'

1 3 7 1 0 9

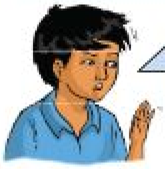
9 ones — 9
0 tens — 0
1 hundreds — 100
7 thousands — 7000
3 ayuts — 30000
(7 thousands and 3 ayuts: 37 thousands)
1 lacs — 100000

1. Read the numbers aloud, write in words and show place value.

(1) 894312 (2) 360518 (3) 730084 (4) 2463751

Challenge!

Reza, can you guess how to read **2463751,** in 1 (4)?



Another place is needed, and I think the number which comes to this place is called ten lacs…?



As Reza guesses, **ten lacs** comes to this place.
1 **ten lac** is written as **1000000**

And this new place is called **nijut**.

Name of the Place	**nijuts**	**lacs**	**ayuts**	thousands	hundreds	tens	ones
	2	4	6	3	7	5	1
	twenty-four lac		sixty-three thousand		seven hundred	fifty-one	

We read **2463751** as:
'twenty four lac sixty three thousand seven hundred and fifty one.'

2 4 6 3 7 5 1

1 ones — 1
5 tens — 50
7 hundreds — 700
3 thousands, 6 ajuts — 63 thousands — 3000, 60000
4 lacs, 2 nijuts — 24 lacs — 400000, 2000000

One nijut (ten lacs) is called 'one million' as well.

2 Read aloud and write in words. Show their place value like above.

(1) 4123476 (2) 6871035 (3) 5609320 (4) 1111111

3 Write in figures.

(1) five lac seventy three thousand six hundred and thirty four
(2) thirty one lac forty five thousand nine hundred and thirty six.
(3) ninety nine lac ninety nine thousand nine hundred and ninety nine
(4) the number made of 7 lacs and 3 ten thousands
(5) the number made of 4 ten lacs 8 thousands and 3 hundreds

19584972 was the number of students in primary schools of Bangladesh in 2013. How do you read it?





So many! I am one of them!

It seems that we need another place again.



We use **crore** for this new place.
1 **crore** is **10 nijut**, and written as **10000000**.

Name of the Place	crores	nijuts	lacs	ayuts	thousands	hundreds	tens	ones
	1	9	5	8	4	9	7	2
	one crore	ninety five lac		eighty four thousand		nine hundred	seventy two	

We read **19584972** as:
'one crore ninety five lac eighty four thousand nine hundred and seventy two.'

1 9 5 8 4 9 7 2

- 2 ones — 2
- 7 tens — 70
- 9 hundreds — 900
- 4 thousands, 8 ayuts — 84 thousands — 4000, 80000
- 5 lacs, 9 nijuts — 95 lacs — 500000, 9000000
- 1 crore — 10000000

4

1. Read aloud, write in words and show place value like above.
   (1) 19584972 (2) 25007024

2. Write in figures.
   (1) one crore twelve lac thirteen thousand six hundred and eighteen
   (2) two crore two lac two thousand two

2025

Use of 'comma'

As you might have found, we often face difficulty in counting large numbers. So we use 'comma' to read the figures of the number easily.



How to put **comma**

[Example]

7,	5	3,	6	5,	7	8	0

2 digits 2 digits 3 digits



crores	nijuts	lacs	ayuts	thousands	hundreds	tens	ones
7,	5	3,	6	5,	7	8	0
seven crore	fifty-three lac		sixty-five thousand		seven hundred	eighty	

Each comma comes after the place of **thousands**, **lacs** and **crores**.

Each comma helps us to understand the places of numbers.

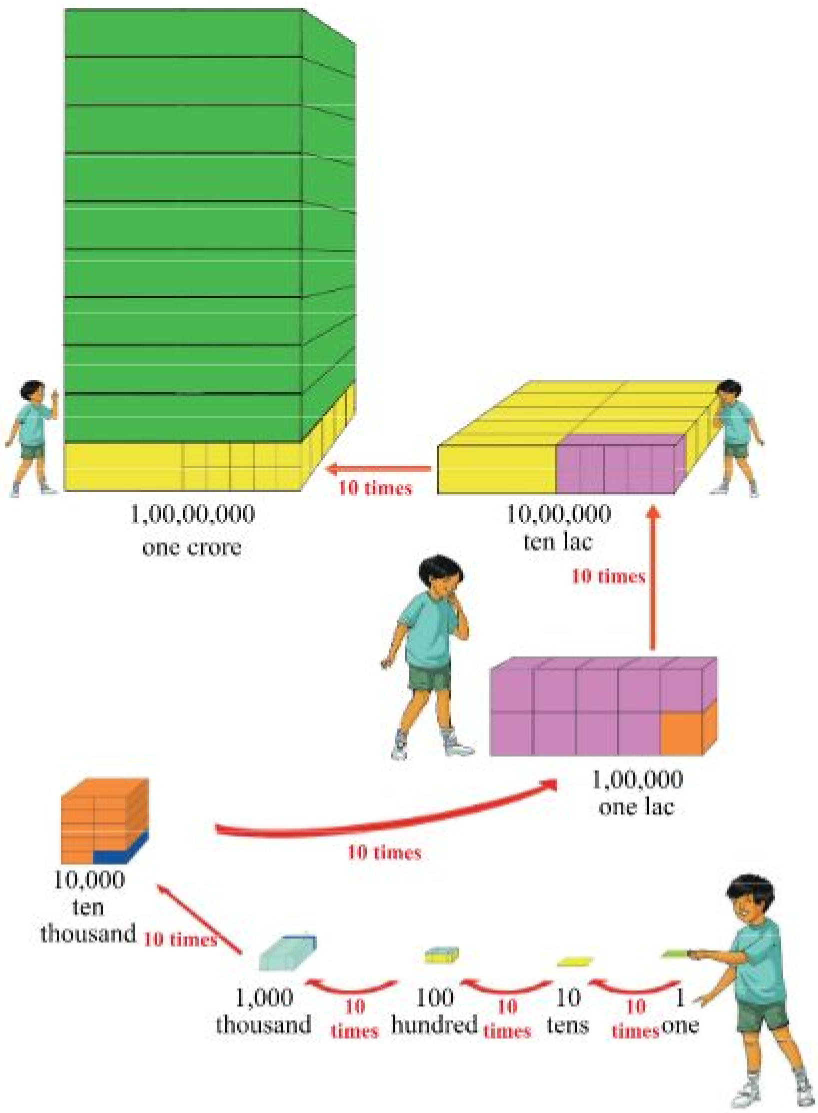


5 Put commas at the right place on the number and read them aloud.

(1) 98784689	(2) 6825712	(3) 130405
(4) 70004	(5) 2171	(6) 44444444

Let's summarise the number counting system for larger numbers.

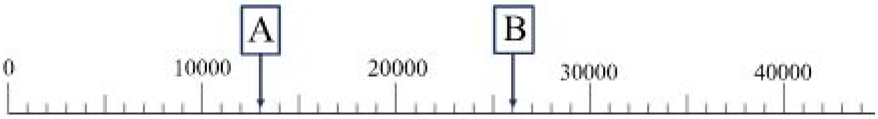
Explain this picture.



(1) How many times is ten thousand larger than one thousand?
(2) How many times is one lac larger than ten thousand?
(3) How many times is one crore larger than ten lac?

1.3 Number Line

What numbers are indicated by A and B on the number line?





Number line is very useful to know the numerical sequence and larger-smaller relation between numbers.

The numbers increase as you go to the right on the number line. And we must be aware of the each interval of the ruler scale.

In this case, each interval of the ruler scale is 1000.

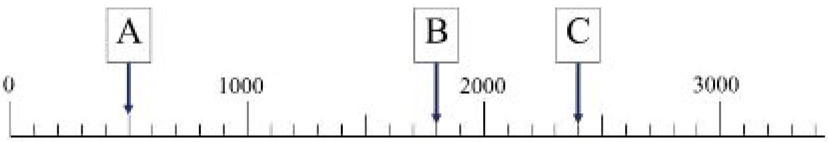


A is 3 intervals after 10000 : **10000** + 3000 = ☐

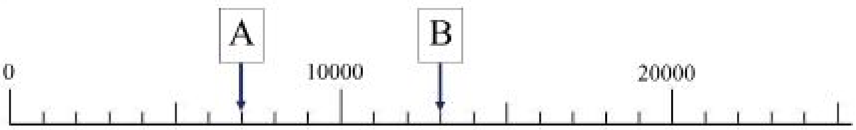
B is 6 intervals after 20000 : **20000** + 6000 = ☐

Write the numbers that correspond with the positions of A, B and C.

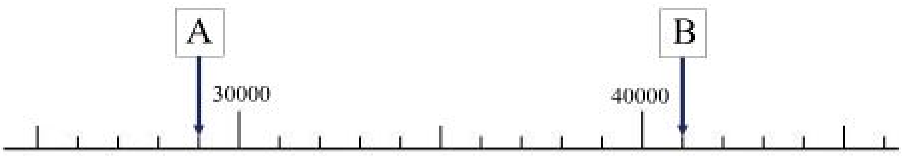
(1)



(2)

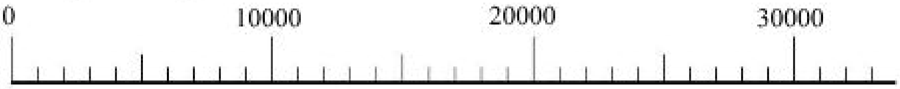


(3)

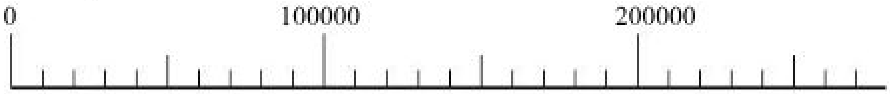


2 Place the numbers on the number line.

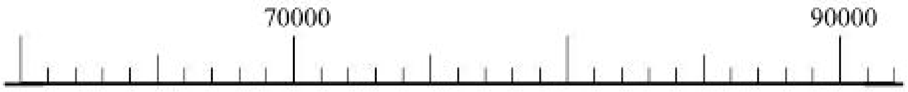
(1) 4000, 16000, 29000



(2) 30000, 300000



(3) 72000, 80000, 89000



1.4 Exercise (1)

1. Read aloud, write in words and show the place value.

(1) 872931 (2) 5178572 (3) 13572468 (4) 1010101

2. Write these numbers in both figures and words.

(1) The number made of 45 thousands

(2) The number made of 100 lacs

(3) The number made of 1000 thousands

(4) The number made of 127 thousands

(5) The number made of 10 lacs, 10 thousands, 10 hundred and 10



Draw place value table on your notebook and using the table form numbers.

crores	nijuts	lacs	ajuts	thousands	hundreds	tens	ones



3. Read these numbers aloud and put the digit at the right place according to the following example.

(Ex.) 48639

nijuts	
lacs	
ayuts	4
thousands	8
hundreds	6
tens	3
ones	9

(1) 402537

nijuts	
lacs	
ayuts	
thousands	
hundreds	
tens	
ones	

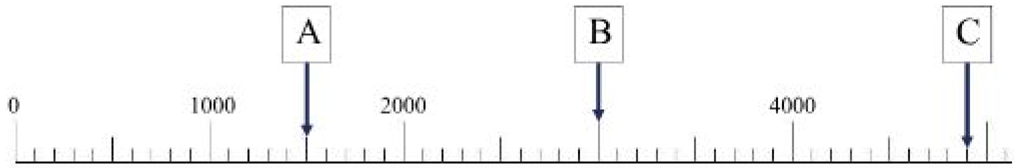
(2) 7080399

nijuts	
lacs	
ayuts	
thousands	
hundreds	
tens	
ones	

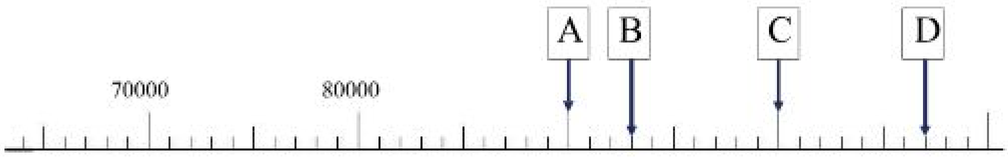
4. Put comma in appropriate position.

(1) 13524689   (2) 9757834   (3) 55555555

5. (1) Put the numbers at the positions from (A) to (C).



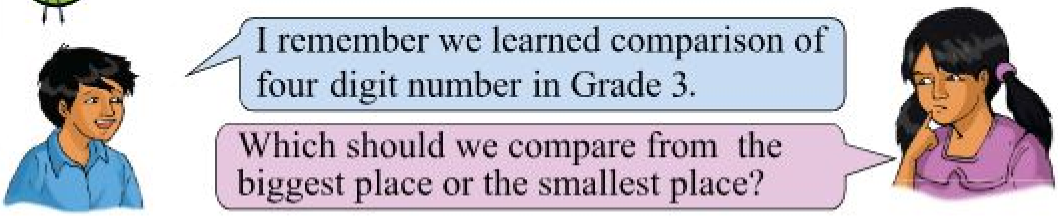
(2) Put the numbers at the positions from (A) to (D).



1.5 Comparison of Numbers

Which number is larger?

1 Which one is larger, 38000 or 36000?



We compare from the biggest place to the smallest one by one

Ajuts are the same.

In thousand place, 8 is larger than 6.

3	8	0	0	0
3	6	0	0	0

So, 38000 is larger than 36000.

$$38000 > 36000$$

2 Let's check 38000 and 36000 on the number line.



1 Compare the following numbers and fill in the blanks with '<' or'>'.

(A) 9530 ☐ 9628 (B) 24800 ☐ 23900

(C) 75000 ☐ 80000 (D) 465311 ☐ 465211

3 Which number is larger, **39000** or **371020** ?



Let's compare the digits from the biggest place to the smallest! So, I think 39000 is larger than 371020.

Wait! We sometimes misread large numbers. Let's put the numbers on the place properly or put comma.



	3	9	0	0	0
3	7	1	0	2	0

39,000 3,71,020



Wow! The number of digits is different! 371020 is clearly greater than 39000!

39000 < 371020

Let's put the numbers on the number line to compare their numerical size.



The way of Comparison of Numbers

1. Compare the number of digits.
   The number consisting of more digits is larger.
2. When the number of digits is the same:
   (1) Compare the biggest place.
   The number which has bigger number is larger.
   (2) If they are the same, compare the second biggest place, and repeat this comparison to the smaller digit until you find the difference.
   (3) If all digits are the same, these two numbers are the same.

2 Compare the following numbers and put '<' or '>' in the boxes.

(1) 87526 ☐ 141632 (2) 9999 ☐ 44444

(3) 4467322 ☐ 464499 (4) 1000456 ☐ 1000465

2025

4 Sakib wants to buy a bicycle and finds different prices in different shops. They are taka 5238, taka 7329, taka 8324, taka 6137 and taka 7325.

Which one is the cheapest and which one is the most expensive? Let us arrange these numbers from the smallest to the greatest sequentially and show them by symbols.

5238 7329 8324 6137 7325



Well, all are four digit numbers. So let's begin with comparing the digits of the biggest place.

How about putting comma to clarify the places?

Let us arrange them vertically in order to compare the numerical size.



5,238 7,329 8,324 6,137 7,325

5	2	3	8
7	3	2	9
8	3	2	4
6	1	3	7
7	3	2	5

What is the smallest number?

What is the second smallest number?

By observing the numbers with the place value, we get:

5238 < 6137 < 7325 < 7329 < 8324

smallest ↑ ... ↑ largest

We can also arrange these numbers from the largest to the smallest.



8324 > 7329 > 7325 > 6137 > 5238

So which price should Sakib prefer?

3 Arrange the following numbers serially from smaller to greater and from greater to smaller and show them by symbols.

98427, 56789, 603245, 791345, 6750283, 97653, 891498

Firstly, it would be better to put them vertically, and compare them.





Which is more convenient, putting comma or putting numbers vertically?

Smaller to greater:

☐ < ☐ < ☐ < ☐ < ☐ < ☐ < ☐

Greater to smaller

☐ > ☐ > ☐ > ☐ > ☐ > ☐ > ☐

5 Prepare four number cards as the following picture and make four digit numbers as many as possible with them. And write all of them down on your note book.

By arranging cards, let's form the numbers.



7 4 9 1

What is the largest number that you can make with these four cards?
And what is the smallest number that you can make with them?

The largest number is: 9741
The smallest number is: 1479



Are there any rules to make the largest or the smallest number ?

Let's exchange our opinion about it and find the rules.

6 Imagine that you have the following five number cards. Now make five digit numbers with them.

8	5	0	2	7

(1) Using all five cards, make the largest five digit number possible.
(2) Using all five cards, make the smallest five digit number possible.



We must be careful about the use of '0'.



Oh, that's right. '0' cannot be put in all the places.

The largest number is: 87520
The smallest number is: 20578

Let's listen to the opinion of other students, exchange our opinion about it and find the rules.


Rita

To make the largest number, we put the highest digit at the beginning, and put the second highest digit at the second place.

Yes, of course. And in this way, the digits are arranged from larger to smaller. 9741 → 87520 →


Sohel



On the other hand, to make the smallest number, we put the smallest digit at the beginning, and the second smallest digit in the second place. As a result, the digits are arranged from smaller to larger. 1479 →

But, we must be careful about '0'. Even though '0' is the smallest digit, it cannot be put at the beginning of the number because no number begins with '0'. So we have to put '0' at the second place instead of beginning.

× 02578 ✓ 20578



We have found some important rules of the structure of numbers.

4 You have the following six number cards. Now make six digit numbers with all of them.

0	1	3	4	7	9



(1) Make the largest number possible.
(2) Make the smallest number possible.
(3) Make the largest **odd** number possible.
(4) Make the smallest **even** number possible.

Find the largest and the smallest number in every digit number up to six-digit number and share with your friends what you have found out.

	largest	smallest
one-digit number		1
two-digit number		
three-digit number		
four-digit number		
five-digit number		
six-digit number		

In this case '0' isn't regarded as one-digit number because it is mathematically very special.

(1) What is the number next to 999?
(2) What is the number before 10000?

2025

1.7 Exercise(2)

1. Compare the following numbers and put '<' , '>' or '='.

(1) 8499 □ 8511   (2) 11100 □ 11001

(3) 289999 □ 290001   (4) 2222221 □ 2222223

(5) 1011001 □ 1011001   (6) 5555555 □ 555555

2. Using the following six number cards, make six digit numbers.

0	2	9	6	8	4

(1) Make the largest number possible.
(2) Make the smallest number possible.
(3) Make the largest **odd** number possible.
(4) Make the smallest **odd** number possible.

3. This is the list of the population of some cities. Arrange these numbers from smaller to larger sequentially and answer which city has the largest population and which has the smallest.

Name of the city	Population
A	371993
B	2456891
C	3704231
D	4589476
E	886397

Chapter Two
Addition and Subtraction

2.1 Addition upto four digit numbers

Add:

(1) 232 + 334 (2) 1325 + 3522

(3)
$$\begin{array}{r} 253 \\ +526 \\ \hline \end{array}$$

(4)
$$\begin{array}{r} 1538 \\ +3421 \\ \hline \end{array}$$

(5)
$$\begin{array}{r} 1231 \\ 103 \\ +6254 \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 1402 \\ 3056 \\ 210 \\ +3120 \\ \hline \end{array}$$

(7) 116 + 228 (8) 2416 + 1375

(9)
$$\begin{array}{r} 364 \\ +472 \\ \hline \end{array}$$

(10)
$$\begin{array}{r} 1538 \\ +3625 \\ \hline \end{array}$$

(11)
$$\begin{array}{r} 4391 \\ 1584 \\ +3625 \\ \hline \end{array}$$

(12)
$$\begin{array}{r} 148 \\ 1275 \\ 2151 \\ +1362 \\ \hline \end{array}$$





$$\begin{array}{r} {\scriptstyle 1\ 2\ 1\ \ } \\ 1373 \\ 4584 \\ +3655 \\ \hline 9612 \end{array}$$

ones place	3 + 4 + 5	= 12
tens place	7 + 8 + 5 (+ 1)	= 21
hundreds place	3 + 5 + 6 (+ 2)	= 16
thuosands place	1 + 4 + 3 (+ 1)	= 9

2025

2.2 Addition up to five digit numbers

Let's try addition with larger numbers.

In a city there live 45736 females and 48797 males. How many people are there in total?



Here, we'll have to find the total number, so the operation will be ______.

Mathematical sentence is: **45736 + 48797** ______

Let's put them up-down and add them.

$$\begin{array}{r} {}^{1}\,{}^{1}\,{}^{1}\,{}^{1}\quad \\ 45736 \\ +\,48797 \\ \hline 94533 \end{array}$$

ones place	6 + 7		= 13
tens place	3 + 9	(+ 1)	= 13
hundreds place	7 + 7	(+ 1)	= 15
thuosands place	5 + 8	(+ 1)	= 14
ajuts place	4 + 4	(+ 1)	= 9

Even though the numbers are bigger, the way of addition is the same as we studied in grade 3!



The number of total population is: **94533**

1 Add:

(1) $\begin{array}{r} 13567 \\ +\,43121 \\ \hline \end{array}$ (2) $\begin{array}{r} 22643 \\ +\,1725 \\ \hline \end{array}$ (3) $\begin{array}{r} 23514 \\ +\,15627 \\ \hline \end{array}$ (4) $\begin{array}{r} 13137 \\ +\,18672 \\ \hline \end{array}$

(5) $\begin{array}{r} 22679 \\ +\,57122 \\ \hline \end{array}$ (6) $\begin{array}{r} 23836 \\ +\,41489 \\ \hline \end{array}$ (7) $\begin{array}{r} 43756 \\ +\,37275 \\ \hline \end{array}$ (8) $\begin{array}{r} 99999 \\ +\,1 \\ \hline \end{array}$

2 The following table lists the sales of a candy shop. How much is the total sale from January to May?

January	Tk.34295
February	Tk.13720
March	Tk.14853
April	Tk.20582
May	Tk.12376



As we want to find out the total amount, so the operation will be ______.

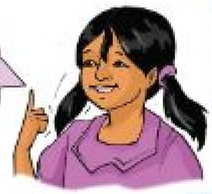
Mathmatical sentence is: **34295 + 13720 + 14853 + 20582 + 12376**

```
   1 2 3 1
   3 4 2 9 5
   1 3 7 2 0
   1 4 8 5 3
   2 0 5 8 2
 + 1 2 3 7 6
 -----------
   9 5 8 2 6
```

ones place	5 + 0 + 3 + 2 + 6	=	16
tens place	9 + 2 + 5 + 8 + 7 (+1)	=	32
hundreds place	2 + 7 + 8 + 5 + 3 (+3)	=	28
thuosands place	4 + 3 + 4 + 0 + 2 (+2)	=	15
ajuts place	3 + 1 + 1 + 2 + 1 (+1)	=	9

The total is Tk. **95826**

The way of addition is basically the same. But here the numbers we carry are larger.



2 Add :

```
(1)          (2)          (3)          (4)
  3 1 2 3      5 3 6 4      1 0 8 2      1 3 9 2 1
  1 4 3 4      2 1 0 3        1 8 3      1 2 5 0 3
+ 4 2 7 2      1 1 3 4      1 4 2 7      3 3 5 5 5
---------    + 3 2 2 5    + 6 2 1 4      1 1 5 0 2
             ---------    ---------    + 2 0 5 1 6
                                       -----------
```



Now, we can do the vertical calculations of big numbers.

2025

3 Add

(1) 1112 + 2221 + 3232 + 2222 (2) 50000 + 4000 + 300 + 20 + 1

(3) 123 + 321 + 4000 + 2222 + 3333

(4) 12311 + 21022 + 11111 + 22222 + 21212

(5)
```
  2513
  1242
+ 5234
```

(6)
```
  1432
  2104
  1735
+ 2621
```

(7)
```
  1232
   103
   328
+ 6254
```

(8)
```
  1402
  3050
  4637
  2210
+ 3126
```

(9)
```
    329
+ 54672
```

(10)
```
  54827
+  2654
```

(11)
```
  43454
+ 37647
```

(12)
```
  99999
+     1
```

(13)
```
  40305
  15246
+ 30837
```

(14)
```
  25302
   3514
    236
+ 34005
```

(15)
```
  24173
   6234
   2558
+  3424
```

(16)
```
  32724
   9063
  12626
  21151
+ 13312
```

(17)
```
  32732
   4328
  64350
   2235
+  2827
```

(18)
```
  13787
  27253
  23856
  16154
+ 16353
```

(19)
```
  21564
  18602
  25678
  21913
+ 12243
```

(20)
```
   9999
  18999
  17999
  19999
+ 29999
```

In case of sideways calculation, we add one by one from ones place to larger places. Then putting ‘ ´ ’ mark on the top of calculated digit is useful.



13421 + 2534 + 40432 + 22020 + 12141



(1) ones place

13421 + 2534 + 40432 + 22020 + 12141 =

				8

(2) tens place

In case of carrying, add to the next place.

13421 + 2534 + 40432 + 22020 + 12141 =

		1	4	8

(3) hundreds place

13421 + 2534 + 40432 + 22020 + 12141 =

	1	5	4	8

Let’s try to calculate the rest.

(4) thousands place

13421 + 2534 + 40432 + 22020 + 12141 =

		5	4	8

(5) ayuts place

13421 + 2534 + 40432 + 22020 + 12141 =

		5	4	8

4 Do the sideways calculation.

(1) 3242 + 1305 + 132 + 1310
(2) 2150 + 3518 + 1310 + 1314 + 1101
(3) 24163 + 10425 + 14203 + 2340 + 16025
(4) 21403 + 14130 + 10137 + 19025 + 21025

Challenge!

5 Let's add some five-digit numbers whose sum is 100000.

[1st step] with two numbers

+					
1	0	0	0	0	0





[example]

1					
	2	0	0	0	0
+	8	0	0	0	0
1	0	0	0	0	0

	1	*1*	*1*		
	1	9	9	9	0
+	8	0	0	1	0
1	0	0	0	0	0

	1	*1*	*1*	*1*	
	1	4	2	5	2
+	8	5	7	4	8
1	0	0	0	0	0

[2nd step] with three numbers

+					
1	0	0	0	0	0

[example]

	1	*1*	*1*	*1*	
	3	3	3	3	4
	3	3	3	3	3
+	3	3	3	3	3
1	0	0	0	0	0

	2	*1*	*1*	*1*	
	1	2	3	4	5
	5	9	4	1	2
+	2	8	2	4	3
1	0	0	0	0	0

[3rd step] with more numbers

+					
1	0	0	0	0	0

[example]

1	*2*	*2*	*2*	*1*	
	2	6	3	9	1
	3	2	5	8	2
	1	9	5	2	3
+	2	1	5	0	4
1	0	0	0	0	0

1	*1*	*4*	*3*	*2*	
	3	1	8	6	5
	2	1	8	6	5
	1	2	8	6	5
	1	1	8	6	5
+	2	1	5	4	0
1	0	0	0	0	0

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2.3 Subtraction up to four digit numbers

1 Subtract:

(1) 230 − 110 (2) 730 − 210 (3) 6760 − 4650

(4) $\begin{array}{r} 597 \\ -\ 397 \\ \hline \end{array}$ (5) $\begin{array}{r} 987 \\ -\ 450 \\ \hline \end{array}$ (6) $\begin{array}{r} 2568 \\ -\ 105 \\ \hline \end{array}$ (7) $\begin{array}{r} 7586 \\ -\ 3215 \\ \hline \end{array}$

(8) 150 − 70 (9) 530 − 90 (10) 455 − 265

(11) $\begin{array}{r} 540 \\ -\ 280 \\ \hline \end{array}$ (12) $\begin{array}{r} 453 \\ -\ 76 \\ \hline \end{array}$ (13) $\begin{array}{r} 3600 \\ -\ 521 \\ \hline \end{array}$ (14) $\begin{array}{r} 8302 \\ -\ 4797 \\ \hline \end{array}$



Let's review how to subtract with 3-digit numbers. We calculate ones place first and subtract in order.



Yes. But be careful about "moving the number."

$\begin{array}{r} {\scriptstyle 3\ 10} \\ 642 \\ -\ 368 \\ \hline 4 \end{array}$

[Ones place] 12 − 8 = 4
We cannot subtract 8 from 2, so move 1 ten (=10 ones) from tens place to ones place and subtract 8 from 12.

$\begin{array}{r} {\scriptstyle 10} \\ {\scriptstyle 5\ 3} \\ 642 \\ -\ 368 \\ \hline 74 \end{array}$

[Tens place] 13 − 6 = 7
We cannot subtract 6 from 3, so move 1 hundred (=10 tens) from hundreds place to tens place and subtract 6 from 13.

$\begin{array}{r} {\scriptstyle 5} \\ 642 \\ -\ 368 \\ \hline 274 \end{array}$

[Hundreds place] 5 − 3 = 2

2.4 Subtraction with five-digit numbers

1 The spectators of yesterday's football match were 47543 people and today's spectators are 50238 people. What's the difference?

As we have to find difference, the operation should be ______ .



We subtract smaller number from bigger number.



Mathematical sentence is: **50238 − 47543**

```
  5 0 2 3 8
− 4 7 5 4 3
-----------
          5
```

[Ones place] 8 − 3 = 5

```
      1 10
  5 0 2 3 8
− 4 7 5 4 3
-----------
        9 5
```

[Tens place] 13 − 4 = 9
We cannot subtract 4 from 3, so move 1 hundred (=10 tens) from hundreds place to tens place and subtract.

```
      10
  4 9  1
  5 0 2 3 8
− 4 7 5 4 3
-----------
      6 9 5
```

[Hundreds place] 11 − 5 = 6
We cannot subtract 5 from 1, so we need to move 1 thousand (=10 hundred) from thousands place to hundreds place, but thousands place is 0. So we have to move 1 ayut (10 thousand) to thousands place. Then we move 1 thousand from thousands place.

```
  4 9
  5 0 2 3 8
− 4 7 5 4 3
-----------
    2 6 9 5
```

[Thousands place] 9 − 7 = 2
We have moved 1 ajut (=10 thousand) to thousands place and moved 1 thousand to hundreds place, so we have 9 in this place.

```
  4
  5 0 2 3 8
− 4 7 5 4 3
-----------
    2 6 9 5
```

[ajuts place] 4 − 4 = 0
When the largest place is 0, we don't need to put 0.

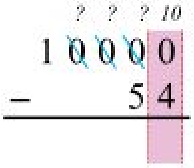
The difference is: 2695 people
(Today's spectators are more than those of yesterday.)

2 An author printed 10000 books, but as printing error was found in 54 books, he cannot sell them. How many books can he sell?



It's a problem for a remainder, so the operation is ☐.

Mathmatical sentence is: **10000 − 54**



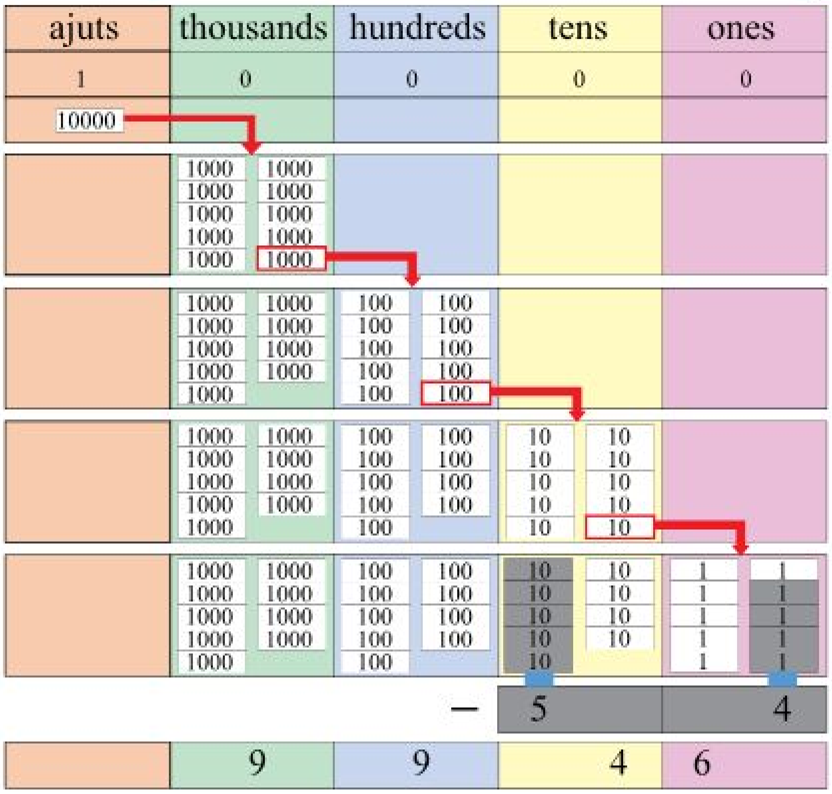
[Ones place]
We cannot subtract 4 from 0, so we need to move 1 ten (=10 ones) from tens place to ones place, but tens place is 0. So we have to move 10 tens from hundreds place, but that place is also 0. Besides thousands place is also 0….



Oh, no! How can we do, then?

Let's think about it with the picture chart.





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$$\begin{array}{r} {\scriptstyle 9\ 9\ 9\ 10} \\ 10000 \\ -\quad 54 \\ \hline \end{array}$$



$$\begin{array}{r} {\scriptstyle 9\ 9\ 9\ 10} \\ 10000 \\ -\quad 54 \\ \hline 6 \end{array}$$

[Ones place] 10 − 4 = 6

$$\begin{array}{r} {\scriptstyle 9\ 9\ 9\quad} \\ 10000 \\ -\quad 54 \\ \hline 46 \end{array}$$

[Tens place] 9 − 5 = 4

$$\begin{array}{r} {\scriptstyle 9\ 9\qquad} \\ 10000 \\ -\quad 54 \\ \hline 946 \end{array}$$

[Hundreds place]
No subtraction.
(or 9 − 0 = 9)

$$\begin{array}{r} {\scriptstyle 9\qquad\quad} \\ 10000 \\ -\quad 54 \\ \hline 9946 \end{array}$$

[Thousands place]
No subtraction.
(or 9 − 0 = 9)

He is able to sell **9946** books

1 Subtract :

(1)
$$\begin{array}{r} 10000 \\ -\quad 1 \\ \hline \end{array}$$

(2)
$$\begin{array}{r} 10000 \\ -\ 2468 \\ \hline \end{array}$$

(3)
$$\begin{array}{r} 10000 \\ -\ 9999 \\ \hline \end{array}$$

(4)
$$\begin{array}{r} 100000 \\ -\qquad 1 \\ \hline \end{array}$$

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2 Subtract :

(1) 4900 − 3700 (2) 10000 − 8000

(3) 32000 − 12000 (4) 86000 − 85200

(5) $\begin{array}{r} 5396 \\ -\ 554 \\ \hline \end{array}$ (6) $\begin{array}{r} 2347 \\ -\ 1164 \\ \hline \end{array}$ (7) $\begin{array}{r} 7129 \\ -\ 3383 \\ \hline \end{array}$ (8) $\begin{array}{r} 8315 \\ -\ 7334 \\ \hline \end{array}$

(9) $\begin{array}{r} 76237 \\ -\ 1571 \\ \hline \end{array}$ (10) $\begin{array}{r} 16847 \\ -\ 1279 \\ \hline \end{array}$ (11) $\begin{array}{r} 76413 \\ -\ 2946 \\ \hline \end{array}$ (12) $\begin{array}{r} 10000 \\ -\ 5900 \\ \hline \end{array}$

(13) $\begin{array}{r} 10000 \\ -\ 7810 \\ \hline \end{array}$ (14) $\begin{array}{r} 10000 \\ -\ 3 \\ \hline \end{array}$ (15) $\begin{array}{r} 17003 \\ -\ 14096 \\ \hline \end{array}$ (16) $\begin{array}{r} 56004 \\ -\ 51428 \\ \hline \end{array}$

(17) $\begin{array}{r} 95014 \\ -\ 76317 \\ \hline \end{array}$ (18) $\begin{array}{r} 35220 \\ -\ 26241 \\ \hline \end{array}$ (19) $\begin{array}{r} 37152 \\ -\ 19356 \\ \hline \end{array}$ (20) $\begin{array}{r} 100000 \\ -\ 8 \\ \hline \end{array}$

3 Subtract sideways.



Just like addition, we can subtract the number of larger places from ones place, putting '´' marks on the top of the calculated digit and check the carrying.

[Example]

$\overset{5}{\cancel{6}}\ \acute{3}\ \acute{4}\ \overset{4}{\cancel{\acute{5}}}\ \acute{3} - 2\ \acute{7}\ \acute{2}\ \acute{4}\ \acute{6} = 3\ 6\ 2\ 0\ 7$

(1) 47560 − 35550 (2) 54300 − 31400

(3) 74444 − 36363 (4) 100000 − 11111

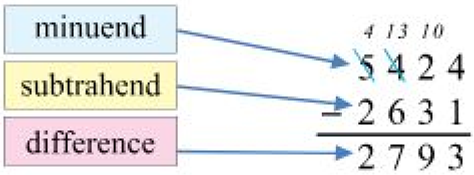
2.5 Relation between Addition and Subtraction

1 A school has 5424 students in total. And the number of girls is 2631. How many boys are there?



We have to find out one part of the total students. So, the operation is ☐.

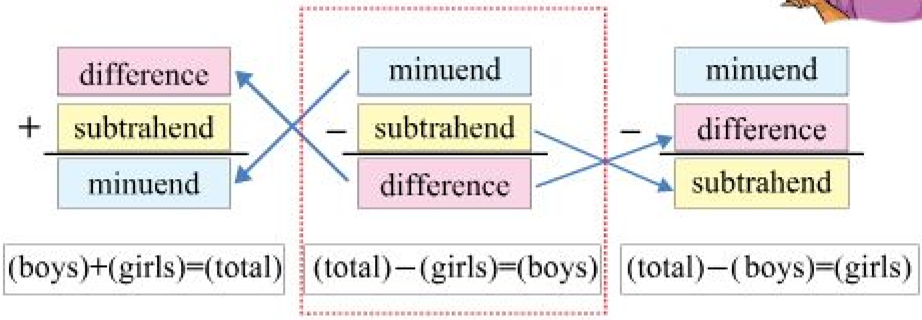
Mathematical sentence is : **5424 − 2631**



The answer is: **2793** boys

As we studied in grade 3, minuend, subtrahend and difference have certain relation.





By using this relationship between addition and subtraction, we can determine the third if we know any two out of the three.

1 Like the previous one, read these two problems and answer.

A school has 2793 boys and 2631 girls. How many students are there in total?	A school has 5324 students in total and among them 2793 are boys. How many girls are there?

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2.6 Problems related to addition and subtraction

1 There were 2450 passengers in the train. In one station, 842 passengers got off and 798 passengers got on. How many passengers are there in the train now?





'Getting off' should be subtraction and 'getting on' should be addition. How can we calculate it?

Mathematical sentence is: **2450 − 842 + 798**

Let's calculate.

```
  2 4 5 0            ┌──────┐
−   8 4 2     ➡      └──────┘
┌──────┐             +   7 9 8
└──────┘
```

Now there are ☐ passengers in the train.

1 Rajib's mother had Tk. 5580. Before going to supermarket, she got Tk. 3420 from Rajib's father and spent Tk. 7830 on her shopping. How much is now left with her?

2 The sum of the present age of mother and her daughter is 112 years. 10 years ago, the daughter was 27 years old. What will be the age of the mother after 8 years from now?



(1) 10 years ago, the daughter was 27 years old. How old is she now?
(2) How old is the mother now?
(3) Let's find the age of the mother after 8 years.



Ah...We can solve the question one by one.

It's interesting to find the other way to get the answer.



2.6 Exercise

1. Do vertical calculation:

(1)
$$\begin{array}{r} 47258 \\ +\ 21631 \\ \hline \end{array}$$

(2)
$$\begin{array}{r} 23456 \\ +\ 56738 \\ \hline \end{array}$$

(3)
$$\begin{array}{r} 67342 \\ +\ 6579 \\ \hline \end{array}$$

(4)
$$\begin{array}{r} 58274 \\ +\ 31726 \\ \hline \end{array}$$

(5)
$$\begin{array}{r} 13242 \\ 34215 \\ +\ 22532 \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 49847 \\ 12142 \\ +\ 18431 \\ \hline \end{array}$$

(7)
$$\begin{array}{r} 14537 \\ 32521 \\ 12512 \\ +\ 23524 \\ \hline \end{array}$$

(8)
$$\begin{array}{r} 17784 \\ 19986 \\ 19123 \\ 19667 \\ +\ 19446 \\ \hline \end{array}$$

(9)
$$\begin{array}{r} 4792 \\ -\ 982 \\ \hline \end{array}$$

(10)
$$\begin{array}{r} 34526 \\ -\ 8 \\ \hline \end{array}$$

(11)
$$\begin{array}{r} 66842 \\ -\ 5933 \\ \hline \end{array}$$

(12)
$$\begin{array}{r} 91276 \\ -\ 89669 \\ \hline \end{array}$$

(13)
$$\begin{array}{r} 87003 \\ -\ 6697 \\ \hline \end{array}$$

(14)
$$\begin{array}{r} 40068 \\ -\ 34174 \\ \hline \end{array}$$

(15)
$$\begin{array}{r} 81111 \\ -\ 58889 \\ \hline \end{array}$$

(16)
$$\begin{array}{r} 100000 \\ -\ 9 \\ \hline \end{array}$$

2. Do sideways calculation.

(1) 13725 + 16131 + 12142 + 13103
(2) 20000 – 18760

3. Fill in the blanks.

(1) $\boxed{}$ − 6483 = 3517
(2) 6874 + $\boxed{}$ = 9300
(3) 42700 + 28800 + $\boxed{}$ = 100000

4. In a godown there are 8375 sacks of sugar, 11860 sacks of wheat and 12720 sacks of rice. Find the total number of sacks in the godown.

5. Find the number which is 500 larger than 1543.

6. What is the difference between the largest and the smallest numbers formed by the digits 6, 4, 8 and 0 using each digit only once?

7. What number can we add to 56806 so that their sum will be 64932?

8. The sum of three numbers is 84025. Among them two numbers are 12450 and 37865. What is the third number?

9. Shihab has taka 390 more than that of Gita. And Gita has taka 470 less than that of Shimul. Shimul has taka 890. How much money do Shihab and Gita have?

10. This table shows the number of students of a school. The total number of girls is 3837. How many boys are there in the school?

Class	Number of students (boys and girls)
1	1632
2	1581
3	1543
4	1499
5	1577

11. Sohag bought a motorcycle by taka 70000. It costs 1500 taka for registration and taka 800 for repairing. If he sells the motorcycle for taka 90000, how much profit will he get?

12. There are a Banyan tree and a Pine tree in a park. 150 years ago, the sum of the age of the trees was 2961 years. Now the Pine tree is 1432 years old. What will be the age of the Banyan tree after 200 years?

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Chapter Three

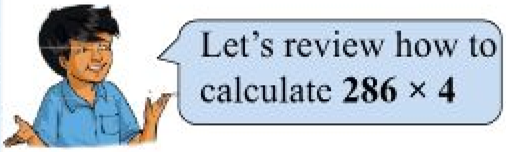
Multiplication

3.1 Multiplication of two-three digit numbers

1 Multiply:

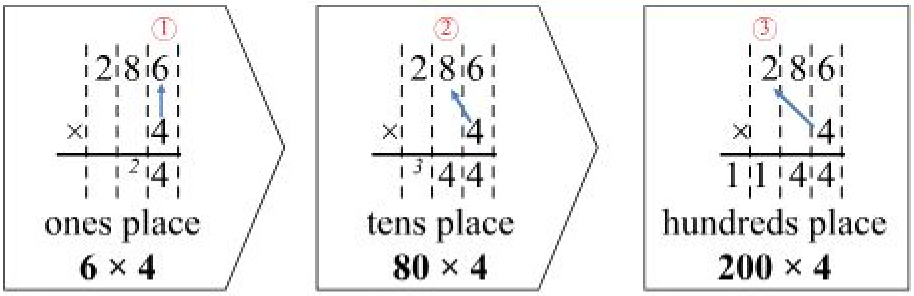
(1) 23×3 (2) 17×4 (3) 221×3 (4) 310×4 (5) 286×6

(6) 663×8 (7) 567×3 (8) 306×4 (9) 21×48 (10) 248×32




```
      2 8 6
   ×      4
   --------
        2 4      6 × 4
      3 2 0  ←  80 × 4      Write in one line.
      8 0 0  ← 200 × 4
   --------
    1 1 4 4
```

Procedure of the calculation



6×4=24 Put 4 in ones place, and carry 2 in tens place.	**8×4=32** Add 2 as the carrying number. (32+2=34) This **34** is placed for **34 tens**.	**2×4=8** Add 3 as the carrying number. (8+3=11) This **11** is placed for **11 hundreds**.

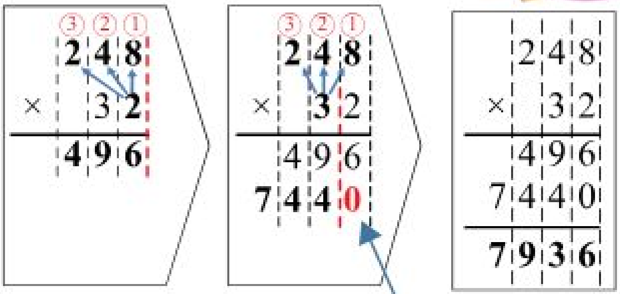
Let's review how to calculate **248 × 32**



Procedure of the calculation

Basic idea

$$\begin{array}{lr} & 248 \\ & \times \quad 32 \\ \hline 248 \times 2 \rightarrow & 496 \\ 248 \times 30 \rightarrow & 7440 \\ \hline & 7936 \end{array}$$



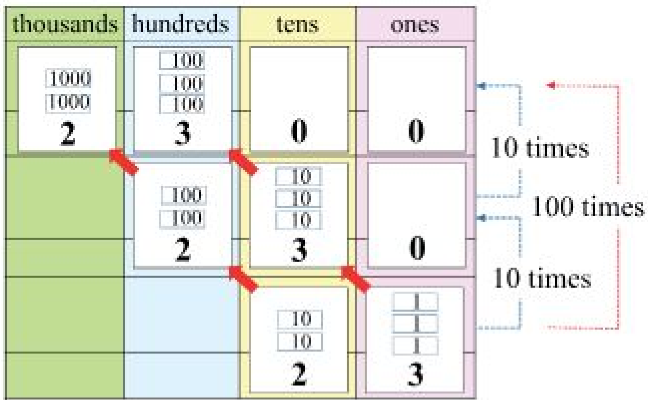
248 × 2 = 496

248 × 30
We regard 248 × 30 as 248 × 3 ×10.

496 + 7440

Put '0' to show the calculation for tens place.

Numbers multiplied by 10 and 100



To multiply any number by 10, move all the numbers one place to the left and put a 0 to the right.

To multiply any number by 100, move all the numbers two places to the left and put two 0s to the right.

1 Multiply :

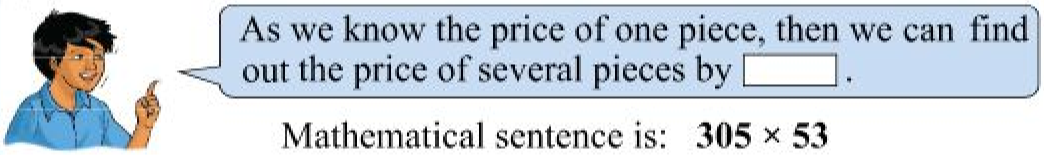
(1) 5 × 10 (2) 13 × 10 (3) 631 × 10 (4) 100 × 10

(5) 8 × 100 (6) 74 × 100 (7) 987 × 100 (8) 100 × 100

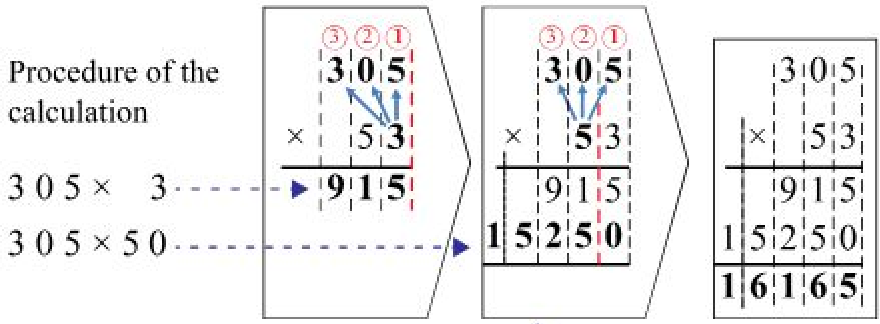
3.2 Multiplication of three-four digit numbers

Let's try to multiply with larger numbers.

There are some Hilsha fishes each of which costs Tk. 305. If you buy 53 of them, how much will it cost in total?



Mathematical sentence is: **305 × 53**



Total cost is: **taka 16165**.

We regard:
305 × 50 as **305 × 5 ×10**

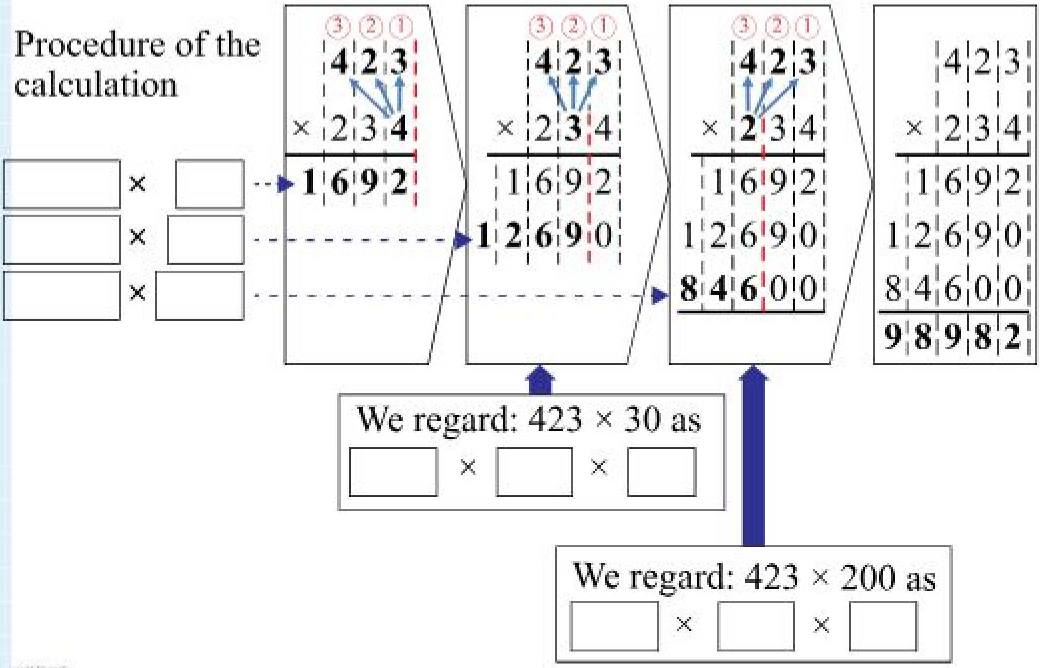
1 Multiply :

(1) 126×67	(2) 325×28	(3) 567×78	(4) 280×63
(5) 841×60	(6) 891×90	(7) 400×77	(8) 600×89
(9) 500×73	(10) 205×54	(11) 803×35	(12) 705×34

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Let's explain how to calculate "**three digit × three digit**".

423 × 234



Multiply :

(1) 152 × 171

(2) 448 × 141

(3) 398 × 122

(4) 242 × 208

(5) 149 × 617

(6) 123 × 747

(7) 556 × 169

(8) 122 × 125

(9) 501 × 140

(10) 140 × 148

(11) 242 × 244

(12) 698 × 132

Challenge!

(13) 1234 × 56

(14) 3247 × 29

(15) 2015 × 322

(16) 6250 × 16

Which way do you think is easier to calculate, (a) or (b)? And explain why?

(a)	(b)	(a)	(b)
$\begin{array}{r} 326 \\ \times\,203 \\ \hline 978 \\ 0000 \\ 65200 \\ \hline 66178 \end{array}$	$\begin{array}{r} 326 \\ \times\,203 \\ \hline 978 \\ 65200 \\ \hline 66178 \end{array}$	$\begin{array}{r} 138 \\ \times\ \ 70 \\ \hline 000 \\ 9660 \\ \hline 9660 \end{array}$	$\begin{array}{r} 138 \\ \times\ \ 70 \\ \hline 9660 \end{array}$



Hmm… (b) looks shorter. What's the difference?

Multiplication of '0' is omitted. It's a good idea. But we must be careful about the places of the digits.



3 Multiply:

(1) $\begin{array}{r} 162 \\ \times\,202 \\ \hline \end{array}$ (2) $\begin{array}{r} 248 \\ \times\,305 \\ \hline \end{array}$ (3) $\begin{array}{r} 472 \\ \times\,109 \\ \hline \end{array}$ (4) $\begin{array}{r} 205 \\ \times\,407 \\ \hline \end{array}$

(5) $\begin{array}{r} 38 \\ \times\,70 \\ \hline \end{array}$ (6) $\begin{array}{r} 203 \\ \times\ \ 90 \\ \hline \end{array}$ (7) $\begin{array}{r} 123 \\ \times\,300 \\ \hline \end{array}$ (8) $\begin{array}{r} 462 \\ \times\,200 \\ \hline \end{array}$

4 Let us do the vertical calculation for 19 × 267. Let us compare the following two methods and think which one is simpler.

(a)

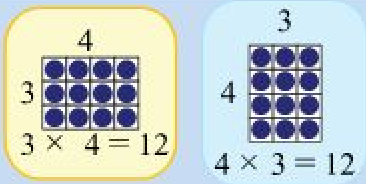
```
      1 9   ← multiplicand
  × 2 6 7   ← multiplier
  -------
    1 3 3
  1 1 4
  3 8
  -------
  5 0 7 3   ← product
```

(b)

```
    2 6 7   ← multiplicand
  ×   1 9   ← multiplier
  -------
  2 4 0 3
  2 6 7
  -------
  5 0 7 3   ← product
```



I remember that we can switch the order of the **multiplicand** and **multiplier** and still get the same product.



So, we can change 19 × 267 into 267 × 19

As the calculations above show, in vertical calculation, considering smaller digit number as multiplier enables us to calculate easier.



4 Tell the difference by comparing the following calculations.

(a) 27 × 369 (b) 369 × 27 (c) 48 × 1273 (d) 1273 × 48

```
(a)     2 7     (b)   3 6 9     (c)       4 8     (d)   1 2 7 3
    × 3 6 9         ×   2 7         × 1 2 7 3         ×     4 8
```

5 Do vertical calculation by the simple method.

(1) 21 × 459 (2) 48 × 273 (3) 54 × 264

(4) 30 × 167 (5) 40 × 178 (6) 2 × 5478

3.3 The simple method

Let's find the easiest way to get to answers.

Let us use '25 ×7 =175' to calculate 2500 × 700.



$$\begin{array}{ccccccc} 25 & \times & 7 & = & 175 & & \\ \downarrow \times 100 & & & & \downarrow \times 100 & & \\ 2500 & \times & 7 & = & 17500 & & \times 10000 \\ & & \downarrow \times 100 & & \downarrow \times 100 & & \\ 2500 & \times & 700 & = & 1750000 & & \end{array}$$



$$\begin{aligned} & 2500 \times 700 \\ &= 25 \times 100 \times 7 \times 100 \\ &= 25 \times 7 \times 100 \times 100 \\ &= 175 \times 10000 \\ &= 1750000 \end{aligned}$$



Both the results are same! Moreover, they have calculated by the simple method.

1. Use '27 × 32 = 864' to do the following calculations.

(1) 270 × 320 (2) 2700 × 32 (3) 270 × 3200

Can't we apply this method to vertical calculation? What do you think?



Then let's try to do vertical calculation of 3400 × 260 by using the simple method, 34 × 26 = 884.

```
  3 4|0 0   ← 100 times    3 4
× 2 6|0     ← 10 times   × 2 6
-----                    -----
2 0 4|                   2 0 4
6 8 0|                   6 8
-----                    -----
8 8 4|0 0 0 ← 1000 times 8 8 4
```

We can consider:

3400×260
$= 34 \times 100 \times 26 \times 10$
$= 34 \times 26 \times 100 \times 10$
$= 884 \times 1000$

On the other hand, we firstly multiply the numbers without using 0. And we secondly put 0 at the end of the product as the same number that the multiplicand and the multiplier have.





Let's compare it with the former method.

```
    3400
×    260
--------
  204000
  680000
--------
  884000
```

Wow! It has too many 0s and is complicated!

2 Do vertical calculation with the simple method.

(1) 36 × 20 (2) 180 × 14 (3) 23 × 1700 (4) 130 × 60

(5) 2630 × 30 (6) 153 × 200 (7) 1230 × 400 (8) 16700 × 20

3.4 Exercise

1. Multiply :

(1) 752×10 (2) 100×10 (3) 453×100 (4) 100×100

(5) $\begin{array}{r} 145 \\ \times \ \ 26 \\ \hline \end{array}$ (6) $\begin{array}{r} 719 \\ \times \ \ 88 \\ \hline \end{array}$ (7) $\begin{array}{r} 560 \\ \times \ \ 63 \\ \hline \end{array}$ (8) $\begin{array}{r} 928 \\ \times \ \ 70 \\ \hline \end{array}$

(9) $\begin{array}{r} 406 \\ \times \ \ 78 \\ \hline \end{array}$ (10) $\begin{array}{r} 208 \\ \times \ \ 30 \\ \hline \end{array}$ (11) $\begin{array}{r} 137 \\ \times 232 \\ \hline \end{array}$ (12) $\begin{array}{r} 132 \\ \times 746 \\ \hline \end{array}$

(13) $\begin{array}{r} 314 \\ \times 209 \\ \hline \end{array}$ (14) $\begin{array}{r} 449 \\ \times 219 \\ \hline \end{array}$ (15) $\begin{array}{r} 207 \\ \times 429 \\ \hline \end{array}$ (16) $\begin{array}{r} 307 \\ \times 203 \\ \hline \end{array}$

(17) $\begin{array}{r} 1265 \\ \times \ \ \ 34 \\ \hline \end{array}$ (18) $\begin{array}{r} 3597 \\ \times \ \ \ 24 \\ \hline \end{array}$ (19) $\begin{array}{r} 2044 \\ \times \ \ \ 41 \\ \hline \end{array}$ (20) $\begin{array}{r} 4189 \\ \times \ \ \ 21 \\ \hline \end{array}$

2. Do vertical caltulation by the simple method.

(1) 61×256 (2) 34×567 (3) 40×456

(4) 1650×30 (5) 789×200 (6) 1230×200

3. Use '$48 \times 19 = 912$' to do the following calculations.

(1) 480×190 (2) 4800×19 (3) 480×1900

4. Explain where the calculations are wrong. Later calculate them correctly.

(A) $\begin{array}{r} 143 \\ \times \ \ 62 \\ \hline 286 \\ 858 \\ \hline 1144 \end{array}$

(B) $\begin{array}{r} 901 \\ \times \ \ 83 \\ \hline 273 \\ 728\ \ \\ \hline 7553 \end{array}$

5. Fill the boxes with appropriate digits:

Challenge!

(1)

$$\begin{array}{r} 2\ 3 \\ \times\ 3\ \square \\ \hline 6\ \square \\ 6\ 9\ 0 \\ \hline 7\ \square\ 9 \end{array}$$

(2)

$$\begin{array}{r} \square\ \square\ 3 \\ \times\ \ \ \square \\ \hline 2\ 3\ 7\ 2 \end{array}$$

(3)

$$\begin{array}{r} \square\ 9 \\ \times\ \ \square\ \square \\ \hline \square\ 7\ \square \\ \square\ 1\ \square\ 0 \\ \hline \square\ \square\ 4\ 3 \end{array}$$

6. You have 100 notes of "one hundred taka". How much money do you have?

7. There are 37 boxes which contain 500 tickets of a cricket match. How many tickets are there in the boxes ?

8. Rahima earns taka 125 daily by sewing. How much money does she earn in 25 days?



9. You have fifteen pieces of 230 metres of ropes. If you put them in one line, what will be the total length of the ropes?

10. If you put Tk. 165 per month in an earthen pot, how much money can you save in one year?

11. Selim sold 185 hens from his poultry farm. He got taka 275 for each hen. How much money did he get in total?

12. 78 pieces of paper are needed to make an exercise book. If you make 955 exercise books, how many pieces of paper will you need?

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Chapter Four

Division

4.1 Division by divisor of one-digit number

Divide:

(1) 42 ÷ 7 (2) 57 ÷ 8 (3) 240 ÷ 3 (4) 420 ÷ 5

(5) 4)80((6) 9)73((7) 6)84((8) 5)61(



Let's review how to divide **93 ÷ 4**.

dividend: 93, divisor: 4

4) 93 (

➡ 4) 9 3 (**2**
8
1

Just look at tens place of dividend.
Write **2** as a quotient of tens place on the right.
Multiply 4 by 2 and get 8.
Subtract 8 from 9 and get **1**. For tens place
9 ÷ 4 = 2 remainder 1

➡ 4) 9 3 (2
8
1 **3**

Bring 3 down.

➡ 4) 9 3 (2 **3** (quotient)
8
1 3
1 2
1 (remainder)

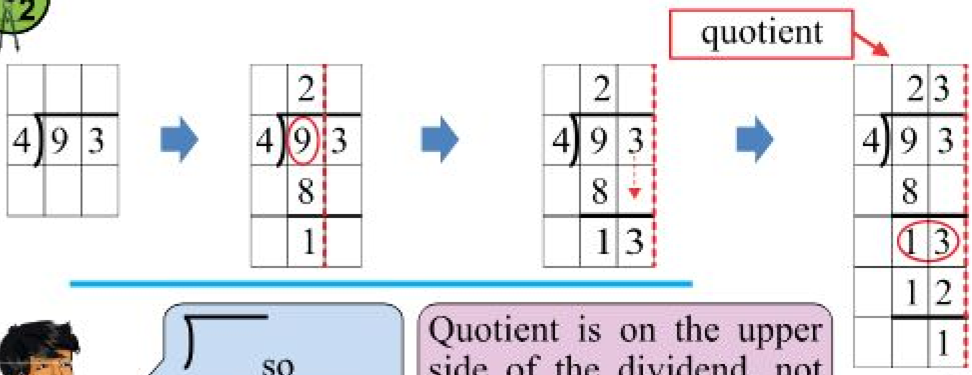
Write **3** as a quotient of ones place on the right. Multiply 4 by 3 and get 12. Subtract 12 from 13 and get **1** as the remainder. For ones place
13 ÷ 4 = 3 remainder 1

Quotient 23 Remainder 1

We write this as **Quotient 23 remainder 1.**

We generally calculate division by this method. However there are other methods for doing division.

2 Compare the following method for division with the previous one.





so interesting.

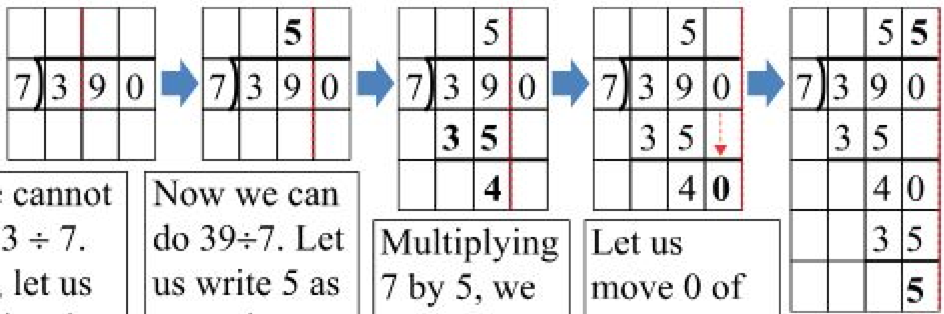
Quotient is on the upper side of the dividend, not on right side of it. But the basic process looks like the same.



The basic process is the same but only the position of the quotient is different. As the place of quotient is in accordance with that of dividend, we don't have to worry about the place of quotient.

After Grade 4, this method will be adopted as the method of division.

3 Do the division of 390 ÷ 7 .



We cannot do 3 ÷ 7. So, let us notice the tens place.	Now we can do 39÷7. Let us write 5 as a quotient on the tens place.	Multiplying 7 by 5, we get 35. We subtract 35 from 39 and get 4.	Let us move 0 of ones place down.	Now we do 40 ÷ 7 in the same way.

Quotient 55 remainder 5

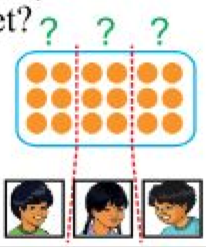
1 Do the division in the international method.

(1) $4\overline{)80}$ (2) $9\overline{)73}$ (3) $6\overline{)84}$ (4) $5\overline{)63}$

(5) $6\overline{)264}$ (6) $8\overline{)182}$ (7) $7\overline{)819}$ (8) $3\overline{)638}$

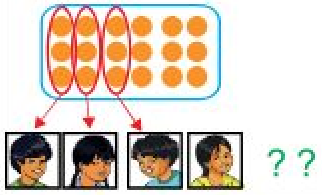
Let us write a mathematical sentence and think which of the following problems can be solved by the method of division.

(1) If 18 candies are divided equally among 3 people, how many candies will each person get?



Answer: 6 candies

(2) If 18 candies are distributed so that each person gets 3 candies, how many people will get candies?



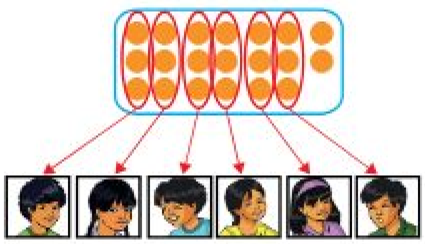
Answer: 6 people

The mathematical sentences of both (1) and (2) are $18 \div 3 = 6$. In both cases, 'Equal Division' and 'Equal Distribution' methods are used.

How to check answers

– Relation between multiplication and division–

If 20 candies are distributed so that each person gets 3 pieces, how many people can get candies and how many candies will be left?



Mathematical sentence: **20 ÷ 3 = 6, remainder 2**

Answer: **6 people will get candies and two candies will be left.**

Let us confirm that adding the 2 remaining candies to the product of (3×6) makes 20 candies.

20 ÷ 3 = 6 remainder 2 — match

3 × 6 + 2 = 20

divisor × quotient + remainder = dividend

This calculation can be used when you check the answers of division.

4.2 Division of 'three-digit number by two-digit number'

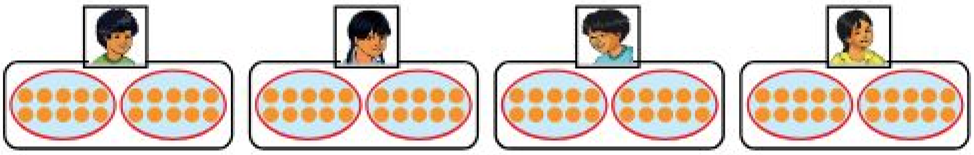
Let's try division with larger numbers.

1 You have 80 candies and each 10 candies are in the small bags.
(1) If you distribute all the candies among your friends by 20 candies each, how many friends can get candies?

Mathematical sentence: **80 ÷ 20**

Now let's think about it in terms of small bags.





Considering group of 10: **8 ÷ 2**

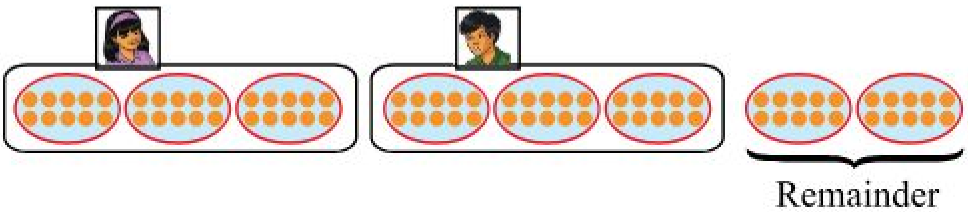


Oh, we can regard 80 ÷ 20 as 8 ÷ 2 in terms of 10

80 ÷ 20 = 4 Answer: 4 persons.

(2) If you distribute 30 candies among each of your friends, how many of your friends will get candies?

Mathematical sentence: **80 ÷ 30**



Considering group of 10: **8 ÷ 3**

80 ÷ 30 = 2, remainder 20

Answer: 2 friends get candies and 20 candies are left.

Check the answers in the previous page using the following formula:

Divisor × quotient + remainder = dividend

(1) $80 \div 20 = \mathbf{4}$ — Correct. — match

$20 \times 4 = 80$

(2) $80 \div 30 = \mathbf{2}$ **remainder 20** — Correct. — match

$30 \times 2 + 20 = 80$

1 Do division and check the answers.

(1) $90 \div 30$	(2) $80 \div 40$	(3) $120 \div 40$	(4) $240 \div 60$
(5) $420 \div 70$	(6) $400 \div 50$	(7) $50 \div 20$	(8) $80 \div 30$
(9) $120 \div 30$	(10) $210 \div 50$	(11) $390 \div 60$	(12) $500 \div 90$

2 Find the mistake in the calculation below. And find the correct answer.

$190 \div 40 = 4$, **remainder** 3

3 You have 85 candies. If you give 21 candies to each of your friends, how many friends will get candies?

The problem is similar to the previous one.



Mathematical sentence is: [ ]

Firstly, let's estimate the quotient.



Think about 85 as 80 and 21 as 20

$85 \div 21$ → $80 \div 20$ → $8 \div 2$

Estimation of the quotient is : $8 \div 2 = \mathbf{4}$



Now, let's think about how to do the long division for $85 \div 21$.

21) 8 5 → 4 over 21) 8 5 → 4 over 21) 8 5, minus **8 4** → 4 over 21) 8 5, minus 8 4, remainder **1**

1. Look at **tens place** of dividend. But we cannot do 8 ÷ 21. So move to **ones place.**	2. Now we can do 85 ÷ 21. We write estimated **4** as a quotient on ones place.	3. Multiply 21 by 4 and get 84.	4. Subtract 84 from 85 and get **1** as a **remainder.**

85 ÷ 21 = 4, remainder 1

Each will get 4 candies and 1 candy will be left.

4 Let's do the vertical calculation for 62 ÷ 31.



We can think about 62 as **60** and 31 as **30**.

62 ÷ 31 → 60 ÷ 30 → 6 ÷ 3

Estimation of the quotient is : 6 ÷ 3 = **2**

31) 6 2 → **2** over 31) 6 2 → 2 over 31) 6 2, minus **6 2** → 2 over 31) 6 2, minus 6 2, remainder **0**

62 ÷ 31 = 2

3 Do vertical calculation.

21) 6 3   11) 6 6   24) 5 1   35) 7 2

(each with boxes: □ quotient, □□ product, □ remainder)

4 Do vertical calculation.

(1) 36 ÷ 12 (2) 96 ÷ 32 (3) 76 ÷ 38 (4) 94 ÷ 47

(5) 25 ÷ 12 (6) 78 ÷ 11 (7) 84 ÷ 41 (8) 94 ÷ 45

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Use of your finger:
It's convenient to use your finger when you check the place.





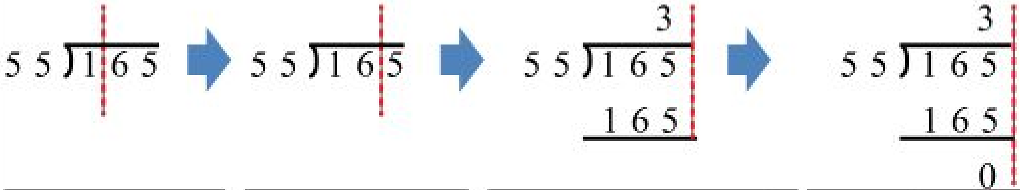
5 There are 165 pencils in a box. If we distribute an equal number of pencils among 55 people, how many pencils will each person get?



For dividing into equal numbers, we choose ______.

Mathematical sentence is: ______

Estimation: 165 ÷ 55 → 160 ÷ 50 → 16 ÷ 5 → About **3**



1. In **hundreds place**, we cannot do 1 ÷ 55. So move to **tens place**.	2. In **tens place**, we also cannot do 16 ÷ 55. So move to **ones place**.	3. Now we can do 165 ÷ 55. We write estimated **3** as a quotient on ones place. Multiply 55 by 3 and get 165.	4. Subtract 165 from 165 and get **0**. No remainder.

165 ÷ 55 = 3

Answer: Each person will get 3 pencils.

5 Do vertical calculation.

(1) 129 ÷ 43 (2) 128 ÷ 32 (3) 415 ÷ 83 (4) 359 ÷ 51

(5) 382 ÷ 62 (6) 314 ÷ 43 (7) 662 ÷ 94 (8) 239 ÷ 47

Estimation is not always correct. It may be higher or lower. Then we have to revise it.

6 Divide :

(1) $95 \div 34$ | $90 \div 30$ → $9 \div 3$ → **3**

Choose smaller number: 3 → 2

$34 \overline{)95}$, 3 × 34 = **102** — Too large to subtract!

→ $34 \overline{)95}$, quotient 2: 95 − 68 = 27

If your estimated quotient is too large, put the next smaller number.



(2) $189 \div 27$ | $189 \div 27$ → $180 \div 20$ → **9**

9 → **8** → **7**

$27 \overline{)189}$, 9 × 27 = **243** — Too large to subtract!

→ $27 \overline{)189}$, 8 × 27 = **216** — Still too large!

→ $27 \overline{)189}$, quotient **7**: 189 − **189** = 0

(3) $77 \div 18$ | $77 \div 18$ → $70 \div 20$ → About **3**

3 → **4**

$18 \overline{)77}$, quotient 3: 77 − 54 = **23** — 23 includes one more 18.

→ $18 \overline{)77}$, quotient 4: 77 − 72 = **5**

If the remainder is too large, put the next larger number.



6 Divide :

(1) $86 \div 24$ (2) $97 \div 19$ (3) $91 \div 13$ (4) $75 \div 15$

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There are 432 pieces of paper. If you distribute an equal number of pieces among 18 people, how many pieces will each one get?



When we divide equally we use ______.

Mathematical sentence is: ______

Estimation: → 430 ÷ 20 → 43 ÷ 2 → About **20**

```
18)432   →      2     →      2     →      24
             18)432       18)432       18)432
                36           36           36
                 7            72           72
                                           72
                                            0
```

1. In hundreds place we cannot do 4 ÷ 18, but in tens place, we can do 43 ÷ 18.

2. Write **2** as quotient of tens place on top and multiply 18 by 2 to get **36**. Subtract 36 from 43 and get **7**.

3. Move to ones place and bring **2** down. Now we have **72**.

4. Now we do **72** ÷ 18 and find **4** as quotient of ones place and no remainder.

We should compare the quotient with the estimation to check whether it's correct or not. In this case 24 is near to 20. It's OK.



432 ÷ 18 = 24

Each person will get 24 sheets.

7 Do vertical division.

(1) 682 ÷ 22 (2) 945 ÷ 45 (3) 672 ÷ 32 (4) 739 ÷ 32

(5) 572 ÷ 12 (6) 610 ÷ 19 (7) 690 ÷ 16 (8) 970 ÷ 46

8 Do the following vertical division.

941 ÷ 23

```
       4            4 0
23 )9 4 1     23 )9 4 1
    9 2            9 2
    ---            ---
      2 1            2 1
                       0
                     ---
                     2 1
```

21 ÷ 23 is not possible but there should be a digit in ones place.
So put '0' as quotient of ones place.

8 Do vertical division.

(1) 711 ÷ 23 (2) 731 ÷ 18 (3) 763 ÷ 25 (4) 810 ÷ 27

4.3 Division of four-digit number by two-digit number.

1 Do vertical calculation.

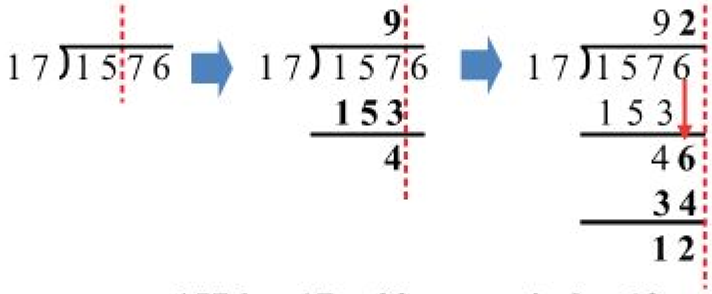
(1) 3266 ÷ 23 ➡ 3000 ÷ 20 ➡ 300 ÷ 2 ➡ About 150

```
       1               1 4                1 4 2
23 )3 2 6 6     23 )3 2 6 6      23 )3 2 6 6
    2 3             2 3              2 3
    ---             ---              ---
      9               9 6              9 6
                      9 2              9 2
                      ---              ---
                        4                4 6
                                         4 6
                                         ---
                                           0
```

3266 ÷ 23 = 142

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(2) 1576 ÷ 17 ➡ 1600 ÷ 2 ➡ 160 ÷ 2 ➡ about 80



1576 ÷ 17 = 92, remainder 12



Both (1) and (2) divisions are "4-digit ÷ 2-digit" numbers. And one quotient is 3-digit number and another is 2-digit. That's mysterious.

Can you tell why the difference occurs?



1 Do vertical division.

(1) 3038 ÷ 14 (2) 7824 ÷ 48 (3) 5876 ÷ 32 (4) 4213 ÷ 27

(5) 4032 ÷ 63 (6) 4920 ÷ 54 (7) 6100 ÷ 72 (8) 1512 ÷ 126 Challenge!

4.4 The simple method

Let's find the simple way to get to answers.

1 Compare the division of 6÷2, 60÷20 and 600÷200

6 ÷ 2	6 candies are distributed so that each person gets 2 pieces…	
60 ÷ 20	60 candies are distributed so that each person gets 20 pieces…	
600 ÷ 200	600 candies are distributed so that each person gets 200 pieces…	



6 ÷ 2 = 3			6 ÷ 2 = 3	
↓ × 10	↓ × 10		↑ ÷ 10	↑ ÷ 10
60 ÷ 20 = 3			60 ÷ 20 = 3	
↓ × 100	↓ × 100		↑ ÷ 100	↑ ÷ 100
600 ÷ 200 = 3		Equal	600 ÷ 200 = 3	Equal

If you multiply or divide the divisor and dividend in a division by the same number, the quotient stays the same.



2 Using the properties of division, let's try the following calculation.

(1) 800 ÷ 200 (2) 1400 ÷ 200 (3) 3500 ÷ 700

(4) 5400 ÷ 60 (5) 1000 ÷ 100 (6) 10000 ÷ 1000



3 3500÷250 was calculated by Ripa, Sumon and Sohag with the simple method. Let's explain their ideas.

(1) Ripa



3500 ÷ 250
↓ ÷ 10 ↓ ÷ 10
350 ÷ 25 = 14

(2) Sumon



3500 ÷ 250
↓ ↓
350 ÷ 25
↓ ↓
70 ÷ 5 = 14

(3) Sohag



3500 ÷ 250
↓ ↓
350 ÷ 25
↓ ↓
1400 ÷ 100 = 14

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1. Using the properties of division, try the following calculation and compare your idea with your friends.

(1) 250 ÷ 50 (2) 8100 ÷ 900

(3) 150 ÷ 25 (4) 700 ÷ 25

4. Let's do the calculation to check whether the following method is correct or not.

> If we divide a number by 10 or 100 by the simple method, we put comma after as many digits from the right of the dividend as the number of zeroes on the right side of the divisor. Then the number of the left of the comma of the dividend will be quotient and the number on its right side will be remainder.
>
> 734 ÷ 10 73¦4 10 — quotient ¦ remainder
>
> 987 ÷ 100 9¦87 100 — quotient ¦ remainder

2. Now let's do the following exercise with the above method.

(1) 876 ÷ 10 (2) 1234 ÷ 10 (3) 765 ÷ 100 (4) 9765 ÷ 100

4.5 Exercise

1. Divide :

(1) 60 ÷ 30	(2) 90 ÷ 40	(3) 240 ÷ 30	(4) 310 ÷ 40
(5) 45 ÷ 15	(6) 92 ÷ 46	(7) 83 ÷ 41	(8) 99 ÷ 28
(9) 168 ÷ 42	(10) 455 ÷ 73	(11) 224 ÷ 28	(12) 141 ÷ 27
(13) 837 ÷ 27	(14) 691 ÷ 16	(15) 928 ÷ 43	(16) 764 ÷ 25
(17) 2795 ÷ 13	(18) 3030 ÷ 14	(19) 1674 ÷ 18	(20) 9316 ÷ 32

2. Do calculation with the simple method.

(1) 7600 ÷ 200 (2) 7200 ÷ 900

(3) 100000 ÷ 1000 (4) 350 ÷ 25

3. Fill in the blank boxes .

Challenge!

(1)

$$\begin{array}{r} 2 \\ 3\square\,\overline{)\,6\ 9} \\ \underline{\square 8} \\ 1 \end{array}$$

(2)

$$\begin{array}{r} 2\ \square \\ 1\square\,\overline{)\,2\ 9\ \square} \\ \underline{2\ 8} \\ 1\ \square \\ \underline{1\ 4} \\ 3 \end{array}$$

(3)

$$\begin{array}{r} \square\square \\ \square 3\,\overline{)\,4\ \square\ 0} \\ \underline{4\ 6} \\ \square\ 0 \\ \underline{0} \\ 1\ 0 \end{array}$$

4. The quotient becomes 3 and remainder is 10 when we divide a certain number by 34. What is the number?

5. There are 99 children. You are making team of 11 to play football games. How many teams can you make?

6. You want to divide 182 postcards equally among 26 people. How many postcards should you give each person?

7. There are 500 pencils. We're putting 12 of them in each box. How many boxes do we need and how many pencils will remain?

8. A wire of 1716 meters in length is divided into 78 equal parts. What is the length of each part?

9. The price of 85 Kg rice is Tk. 2295. What is the price of 1 kg rice?

10. You have 2784 beads. You need 98 beads to make a garland. How many garlands can you make with them?



Chapter Five

Problems related to Four Basic Operations

5.1 Mathematical Sentence and Calculation Order

Let's be familiar with mathematical sentences and learn calculation order!

1 Sohel bought a chicken for Tk. 230, later he also bought pulse for Tk. 60 and vegetables for Tk. 40. Write a mathematical sentence to calculate the total cost and solve it.

Let's try to express the situation in a single mathematical sentence .



Mathematical sentence: ____________________



Let's see these ideas, compare the mathematical sentences and explain how Hasan and Shila thought to solve the problem.



Hasan

230 + 60 + 40
= 330
Taka 330



Shila

230 + (60 + 40)
= 130 + 100
= 330 Taka 330

How interesting! mathematical sentences tell us how a person thinks about solving the problem.



The answer is the same whether you add the numbers one by one or in group. You can use bracket '( )' to show you are calculating by grouping. **In general, we calculate from left to right**, but **calculate the numbers inside the bracket first** when we have the bracket.

230 + 60 + 40 — ① 230 + 60, ② then + 40

230 + (60 + 40) — ① 60 + 40, ② then 230 +

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2 Rita had taka 820. She gave her daughter taka 260 and her son taka 240. Write a mathematical sentence to calculate how much she has now and solve it.

Mathematical sentence: ______________________



Let's compare the ideas of Mitu and Sabuj and explain how they thought.



Mitu's idea

820 − 260 − 240

= 560 − 240

= 320 Taka 320



Sabuj's idea

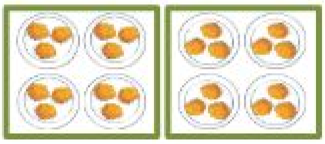
820 − (260 + 240)

= 820 − 500

= 320 Taka 320

The answer is the same whether you subtract the numbers one by one or in group inside the bracket to add first and subtract. In case of subtraction, you need to be careful about calculation inside the bracket because it's addition.

3 There are 2 trays and each has 4 plates on it. I have put 3 piajus in each plate. Write a mathematical sentence to calculate how many piajus are there in 2 trays and solve it.



Mathematical sentence: ______________________



Kazol's idea

3 × 4 × 2

= 12 × 2

= 24 24 piajus



Aminul's idea

3 × (4 × 2)

= 3 × 8

= 24 24 piajus



Kazol finds the number of piaju on one tray (3×4) first, right?

Aminul thinks about the number of plates (4×2), firstly.



Sometimes, these rules enable us to calculate easier. Let's try to do the next exercise.

1 Calculate and compare the answers.

(1) $\begin{cases} 128 + 92 + 8 \\ 128 + (92 + 8) \end{cases}$ (2) $\begin{cases} 376 + 181 + 19 \\ 376 + (181 + 19) \end{cases}$

(3) $\begin{cases} 657 - 64 - 36 \\ 657 - (64 + 36) \end{cases}$ (4) $\begin{cases} 928 - 375 - 125 \\ 928 - (375 + 125) \end{cases}$

(5) $\begin{cases} 37 \times 20 \times 50 \\ 37 \times (20 \times 50) \end{cases}$ (6) $\begin{cases} 78 \times 25 \times 4 \\ 78 \times (25 \times 4) \end{cases}$

2 Express the following problems in a single mathematical sentence and solve it.

(a) The price of a pencil box is Tk. 150. How many pencil boxes can you purchase by Tk. 750?

Mathematical sentence: ☐

The answer: ________

(b) A box contains a bat of Tk. 100 and a ball of Tk. 50. How many boxes can you purchase by Tk. 750?

Mathematical sentence: ☐

The answer: ________

3 Make your own story for Mathematical sentences below and solve them.

(1) 200 + (150 + 70)

(2) 100 − (10 + 60)

My story is this:
In our garden, we have 200 Rose plants. Now my mother plants 150 and my father plants 70 more. How many rose plants do we have now?

2025

4 Let's try to make general mathematical sentence using '( )' for each of the following problem.

(a) The price of a *Singara* is Tk. 6 and I have a 100 taka note. How much will be the change if I buy ten *Singaras*?

$\square - (\square \times \square)$

(b) The price of a Hilsha fish is Tk. 300 and a pair of pigeon is Tk. 200. How much will be the cost if I buy one Hilsha fish and one pigeon?

$\square + (\square \div \square)$

(c) The price of a cabbage is Tk. 25 and a pumpkin is Tk. 60. How much will be the cost of 2 cabbages and 3 pumpkins?

$(\square \times \square) + (\square \times \square)$

When you solve both addition or subtraction and multiplication or division in the same Mathematical sentence, the rule is that you must calculate the multiplication or division first. (But in multiplication and division, you must calculate from left to right.)

With this rule, we don't have to use '( )' in the Mathematical sentences above. We can rewrite them like this:

(a) $100 - (10 \times 6)$ ➡ $100 - 10 \times 6$

(b) $300 + (200 \div 2)$ ➡ $300 + 200 \div 2$

(c) $(25 \times 2) + (60 \times 3)$ ➡ $25 \times 2 + 60 \times 3$

4 Calculate them.

Be careful about the order of the calculation.



(1) $6 + 12 \times 5$ (2) $300 - 150 \div 50$

(3) $200 - 25 \times 4$ (4) $60 + 30 \div 6$

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5 Calculate applying the rules for calculation order.

(a) $9 \times 8 + 4 \times 2$

(b) $9 - 8 \div 4 \times 2$

(c) $9 - (8 - 4 \times 2)$

Oh, it's complicated…



(a) $9 \times 8 + 4 \times 2 = 72 + 4 \times 2$
$= 72 + 8$
$= 80$

(b) $9 - 8 \div 4 \times 2 = 9 - 2 \times 2$
$= 9 - 4$
$= 5$

(c) $9 - (8 - 4 \times 2) = 9 - (8 - 8)$
$= 9 - 0$
$= 9$



Let's summarise the calculation order rules.

- In general, calculate from left to right.
- If there are both + or − and × or ÷, calculate the × or ÷ first.
- If there is '( )', calculate inside the '( )' first.

5 Calculate them.

(1) $16 - 4 + 2$ (2) $16 - (4 + 2)$

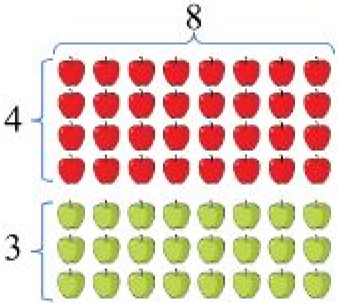
(3) $16 \div 4 \div 2$ (4) $16 \div (4 \div 2)$

(5) $16 + 4 \div 2$ (6) $(16 + 4) \div 2$

5.2 Rules and Ideas for Calculation

Let's get the new rules and ideas for calculation.

1 There are some red apples and green apples. How many are there in total?







Dipika's idea
$(4 + 3) \times 8 = 56$
56 apples



Shaymol's idea
$4 \times 8 + 3 \times 8 = 56$
56 apples

We get the same answers for both Mathematical sentences. Even though Mathematical sentences are different, you can connect them with equal sign as long as the answers are equal on both sides.

$$(4 + 3) \times 8 = 4 \times 8 + 3 \times 8$$

Here are some rules for Mathematical sentences which use ( ).

(■ + ▲) × ● = ■ × ● + ▲ × ●
(■ − ▲) × ● = ■ × ● − ▲ × ●

It can be verified by putting different numbers in place of ■, ▲ and ●.

1 Following the above rules calculate to make sure that both Mathematical sentences are same :

(a) $(135 - 35) \times 7$ (b) $135 \times 7 - 35 \times 7$

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2 Use calculation rules to get the answer.

(1) 25×32

Remember the fact: $25 \times 4 = 100$
If you can find 4, it'll be very easy.



$$25 \times 32 = 25 \times (4 \times 8)$$
$$= (\square \times \square) \times 8$$
$$= (\square) \times 8$$
$$= \square$$

(2) 99×9

I know that '99 = 100 − 1'
Let's use this!
If you can find 4, it'll be very easy.



$$99 \times 9 = (100 - 1) \times 9$$
$$= \square \times 9 - \square \times 9$$
$$= \square - \square$$
$$= \square$$

2 Find an alternative easier way to calculate the following. Explain your idea in your notebook.

(1) 25×16 (2) 24×25 (3) 50×18

(4) 98×5 (5) 102×11 (6) 999×9

3 Solve it by using calculation rules.

(1) Bidhan Tripura bought five water melons of taka 98 each. How much did it cost?

(2) Maya has 36 small bags. Each bag has 25 olives. How many olives does she have in total?

5.3 Exercise

1. Calculate applying the rules for calculation order.

(1) $7 \times 8 - 6 \div 2$ (2) $7 \times (8 - 6 \div 2)$

(3) $(7 \times 8 - 6) \div 2$ (4) $7 \times (8 - 6) \div 2$

2. Use the calculation rules to calculate the following.

(1) $724 + 87 + 13$ (2) $624 - 76 - 24$

(3) $20 \times (66 \times 50)$ (4) $4 \times 92 \times 25$

(5) 32×25 (6) 97×8

3. Express the situation in a single mathematical sentence and solve it.

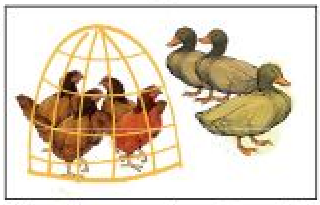
(1) Price of 5 pencils is taka 60. How much is the price of 9 pencils?

(2) Divisor is 3 times the remainder and the quotient is 4 times the divisor. Remainder is 2. What is the dividend?

(3) Monthly salary of Ms Shampa is taka 7500. She spends taka 7250 every month. How much money does she save in a year?

4. Rupa and Moni have taka 875 together. Moni has taka 125 more than that of Rupa. How much money do they have separately?

5. The sum of the age of father and son is 55 years. Father's age is 4 times more the son's. How old are they individually?



6. Price of 4 hens and 3 ducks together is taka 639. Price of 1 duck is taka 85. What is the price of 1 hen?

7. Make your own story for Mathematical sentences below and solve them.

(1) $200 - (10 \times 8)$

(2) $(6 \times 8) + (12 \times 2)$

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Chapter Six

Mathematical Symbols

6.1 Mathematical Symbols

Let's learn mathematical symbols.

Let us look at following mathematical sentences These are formed by various mathematical symbols. Try to classify them.

$2 + 3$	$30 \div 5 + 8$	$7 - 6 = 1$
$4 \times 6 < 26$		$35 \div 5 \nless 2 \times 3$
$8 \times 7 \neq 55$	$35 \ngtr 53$	$9 \times 6 > 45$

Mathematical symbols are classified as shown below:

Symbols used for writing down the numbers are called:
Numeral Symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9

Symbols used for basic four operations are called:
Operation Symbols $+, -, \times$ and $\div$

Symbols used to indicate the mutual relation are called:
Relation Symbols $=, >, <, \neq, \ngtr$ and $\nless$



We have to be careful about the names of the **Relation Symbols.**

$=$ equal	$>$ greater than	$<$ smaller than
$\neq$ **not equal**	$\ngtr$ **not greater than**	$\nless$ **not smaller than**

1 Express the following by using the mathematical symbols.

(1) Forty-seven is not greater than ninety- six.
(2) Nine hundred and nine is not equal to nine thousand and nine.
(3) Twenty-five is not less than twenty-four.

2 Put '$=$' or '$\neq$' in the blank boxes.

(1) 3×5 □ 15 (2) $24 \div 12$ □ 3

3 Put '$\nless$' or '$\ngtr$' in the blank boxes.

(1) 73 □ 37 (2) $20 + 9$ □ 30

2 Put the appropriate **relation symbols** in the blank box.

(1) $6 + 2 \times 4$ □ $(6 + 2) \times 4$

(2) $52 - 15 + 13$ □ $52 - (15 - 13)$



(1) [left side] [right side]

$$6 + 2 \times 4 = 6 + 8 = \mathbf{14}$$

$$(6 + 2) \times 4 = 8 \times 4 = \mathbf{32}$$

<u>**14 < 32**</u>

$\therefore 6 + 2 \times 4$ □ $(6 + 2) \times 4$

'$\therefore$' is a symbol which means "therefore."

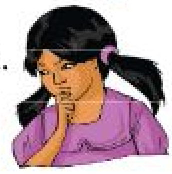
(2) [left side] [right side]

$$52 - 15 + 13 = 37 + 13 = \mathbf{50}$$

$$52 - (15 - 13) = 52 - 2 = \mathbf{50}$$

<u>**50 = 50**</u>

$\therefore 52 - 15 + 13$ □ $52 - (15 - 13)$



4 Put the appropriate relation symbols in the blank box.

(1) $142 - 65$ □ $57 + 12$

(2) $63 \div 7 \times 5$ □ $63 \times 5 \div 7$

6.2 'True' or 'False' with Mathematical Sentences

Let's study 'true' and 'false' with mathematical sentences.

1 The following are all mathematical sentences. Which one is true and which one is false?

(a) $15 + 7 = 22$
(b) $12 \div 5 = 5$
(c) $6 \times 3 = 2 \times 9$
(d) $3 \times 12 < 30 + 2$



Compare the left side and the right side of the relation symbols carefully.

	[left side]		[right side]	
(a)	$15 + 7$ **= 22**	=	**22**	∴ **true sentence**

Because 22 is equal to 22.

(b)	$12 \div 5$ **= 2,R2**	=	**5**	∴ **false sentence**

Because quotient 2 and remainder 2 are **not** equal to 5.

(c)	6×3 **= 18**	=	2×9 **= 18**	∴ **true sentence**

Because 18 is equal to 18.

(d)	3×12 **= 36**	<	$30 + 2$ **= 32**	∴ **false sentence**

Because 36 is **greater** than 32.

Mathematical sentence may be true or false.

1 Look at the following mathematical sentences. Which one is true and which one is false?

(a) $46 - 7 = 40$

(b) $18 \div 9 \ngtr 2$

(c) $12 \times 5 \neq 120 \div 2$

2 Is following mathematical sentence 'true'?

$\square + 9 = 15$

This time, it's a little bit complicated, isn't it?



[left side]		[right side]	
$\square + 9$	=	15	**true sentence?** **false sentence?**
	???		

Regarding the mathematical sentence above, we cannot say it's true or false immediately. It may be true or false. So it's open. Such a mathematical sentence is called open sentence.

Whether the open sentence is 'true' or 'false' depends on the values that are used.



In this case, if 6 is put in $\square$, the mathematical sentence will be true. And if another number is put, the mathematical sentence will be false.

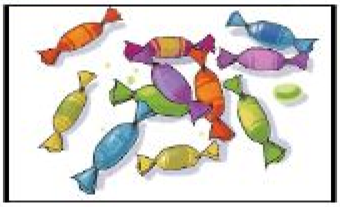
$\boxed{6} + 9 = 15$ **true sentence**

$\boxed{5} + 9 = 15$ **false sentence**

This $\square$ can take any value. Whether the mathematical sentence is true or false depends on the value which is put in the $\square$.

6.3 Mathematical sentences with □

Let's make and solve mathematical sentences with □.



Mukta has some candies and Apu has 6 candies. The total number of the candies they have is 18.

(1) Write a mathematical sentence for above statement, assuming that Mukta has □ number of candies.

(2) Find the unknown number to be filled in the □.

---

(1) The mathematical sentence should be: □ + 6 = 18

(2) The unknown number to be filled in the □ should be:

We can calculate it by putting different numbers in the blank boxes.

$\boxed{10} + 6 = 18$ ×

$\boxed{11} + 6 = 18$ ×

$\boxed{12} + 6 = 18$ ✓

$\boxed{13} + 6 = 18$ ×

We can solve it using the relation between addition and subtraction.

$\square = 18 - 6$

$= 12$



$\square = 12$



1 There were 21 Plums . Some of the Plums were eaten by some friends and 14 of them remained.

(1) Write a mathematical sentence assuming the number of Plums eaten are □ pieces.

(2) Find the unknown number.

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32 pieces of Ruti are divided equally among some people and each person gets 8 pieces.

(1) Write a mathematical sentence assuming the number of people is □.

(2) Find the unknown number.

---

(1) The mathematical sentence should be: $32 \div \square = 8$

(2) Unknown number to be filled in for □ should be:

We can calculate it by putting different numbers in the blank boxes.

$32 \div \boxed{2} = 8$ ✗

$32 \div \boxed{3} = 8$ ✗

$32 \div \boxed{4} = 8$ ✓

$32 \div \boxed{5} = 8$ ✗

We can solve it using the way of checking answers of division:

$8 \times \square = 32$

And to solve this, we can do:

$\square = 32 \div 8$

$= 4$



$\square = 4$



2 Write mathematical sentences of the following statements using □ as the unknown numbers and find the value of □.

(1) 12 is added to a number so that their sum becomes 180.

(2) A number is multiplied by 15 so that their product becomes 270.

6.4 Exercise

1. Put a relation symbol in the blank boxes so that the obtained statement can be true.

   (1) $87 + 13 \;\square\; 108 - 19$

   (2) $267 - 25 - 27 \;\square\; 267 - (25 + 27)$

   (3) $343 \div 7 \div 7 \;\square\; 343 \div (7 \times 7)$

2. Verify which of the following statements are true and which are false.

   (1) $76 - 34 + 30 = 76 - (34 - 30)$

   (2) $200 - 25 \times 4 \neq (200 - 25) \times 4$

   (3) $32 \div 4 \div 2 \not< 32 \div (4 \div 2)$

   (4) $3 \times 6 + 4 \times 2 = 3 \times (6 + 4) \times 2$

3. Put such an operational sign in the blank boxes so that the obtained statement can be true.

   (1) $69 \;\square\; 13 = 7 \;\square\; 8$ (2) $58 \;\square\; 29 = 96 \;\square\; 9$

   (3) $8 \;\square\; 5 = 1200 \;\square\; 30$ (4) $87 \;\square\; 38 = 7 \;\square\; 7$

4. Put such a number in each of the following open sentences so that the obtained statement can be true.

   (1) $\square + 9 = 49 - 15$ (2) $9 \times \square = 36 \times 2$

   (3) $81 \div \square = 27 \div 3$ (4) $3 + 8 \times \square = 35$

5. Express the following questions by using $\square$ and find the unknown number.

   (1) A number is divided by 7. Quotient is 5 and remainder is 4.

   (2) 7 is multiplied by the sum of a number and 3. And product is 56.

Chapter Seven

Multiples and Factors

7.1 Multiples and Common Multiple

Let's learn about multiples.

In the shop, boxes which contain cookies and chocolates are piled up separately.



The height of the each box containing cookies is 3 cm.
Let's find the relation between the number of the boxes and the total height of them when we pile up the boxes.

Number of the boxes	1	2	3	4	5	6	7
Total height (cm)	**3**	**6**	**9**	**12**			

The numbers like 3, 6, 9, and 12 are formed by multiplying a number by 3. They are called **multiples of 3.** Multiples of 3 are divisible by 3.

multiples of 3

3 6 9 12
15 18 21
24 27 30
33 36...

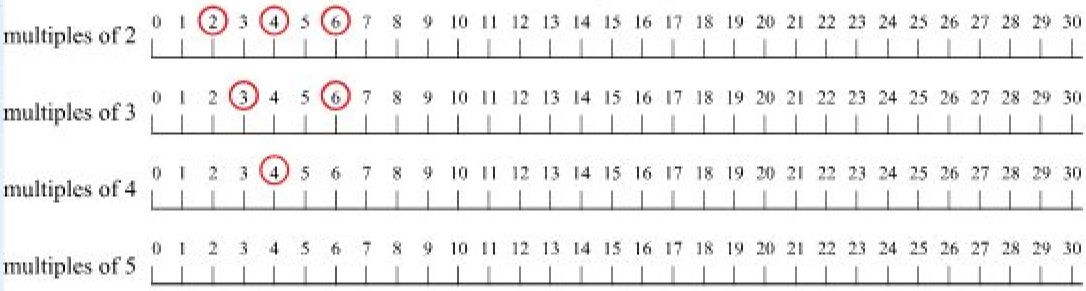


The multiples of 3 are:
$3\times1=3$, $3\times2=6$, $3\times3=9$, and many more.

When we talk about multiples, we usually do not include multiples of 0 or numbers multiplied by 0.



1. Circle **multiples of 2** on the number line below. And also circle **multiples of 3,multiples of 4** and **multiples of 5** on the number line. (Some have been done for you.)



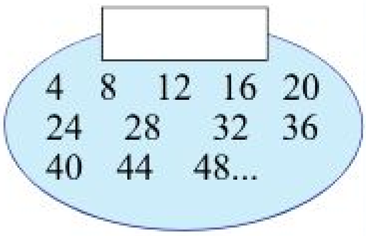
2. Which numbers in the box below are the multiples of 7?

7 16 21 32 65 84

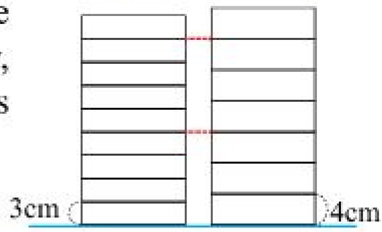
Remember that multiples of 7are divisible by 7.

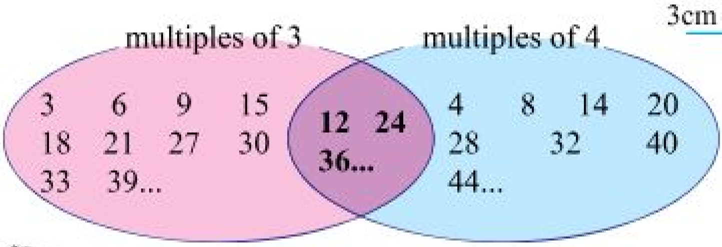


3. The height of the boxes which contain chocolates is 4 cm. When we pile up the boxes, how should we call the numbers for expressing the total height?



2. If we keep piling up the cookies boxes with the height of 3 cm and chocolate boxes with the height of 4 cm separately, when does the height of both piled boxes become equal?







Wow, we can find the answer using multiples of both 3 and 4.

Answer: The height is equal when the height of both pills becomes 12, 24, 36...

Numbers that are multiples of both 3 and 4 are called **common multiples** of 3 and 4.
The **common multiples** of 3 and 4 are 12, 24, 36, and many more.

3 Let us find the common multiples of 6 and 8.

Let's compare these two ideas.





Mousumi

Multiples of 6:	6, 12, 18, (24), 30, 36, 42, (48)...
Multiples of 8:	8, 16, (24), 32, 40, (48), 56, 64, 72...

Firstly, I will list the multiples of 6 and multiples of 8, and then find out the numbers that are the same.



Tamim

Multiples of 8:	8,	16,	24,	32,	40,	48,	56,	64,	72...
Multiples of 6:	×	×	✓	×	×	✓	×	×	✓

I have found out the multiples of 6 in a list of multiples of 8.

Answer: The common multiple of 6 and 8 are 24, 48, 72 and many more.

The smallest common multiple is called the **least common multiple (LCM)**. The least common multiple of 6 and 8 is 24.

4 List 3 common multiples for the following pairs of numbers, ordering them from the smallest. And also write the least common multiples (LCM).

(1) 2, 3 (2) 4, 5 (3) 10, 5 (4) 3, 7



By the way, can we also find common multiples for sets of 3 numbers?

Yes, by the same method. Let us try it on the next page.



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4 Find common multiples and the least common multiple (LCM) for 2, 3, and 4.



Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24...
Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36...
Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40...



Multiples of 4:	4	8	12	16	20	24	28	32	36	40...
Multiples of 3:	×	×	✓	×	×	✓	×	×	✓	×
Multiples of 2:	×	×	✓	×	×	✓	×	×	✓	×



Can everyone explain how to do it?

Which method do you think is easier?



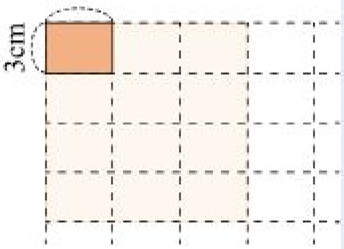
Answer: Common multiples for 2, 3, and 4 are **12, 24, 36** and many more.

Least common multiple (LCM) of 2, 3, and 4 is **12**

5 Find the least common multiple (LCM) of the following.

(1) 4, 6, and 9 (2) 4, 8, and 12 (3) 4, 5, and 6

5 We want to arrange rectangular tiles of 4 cm long and 3 cm wide like the figure on the right to make the smallest square possible. How many centimeters will be one side of the square?





The multiples of width are 3, 6, 9, 12... and the multiples of length are 4, 8, 12, 16...

It's going to be the least common multiple (LCM) of 3 and 4.



Multiples of 4: 4, 8, 12, 16, 20, ...
Multiples of 3: × × ✓

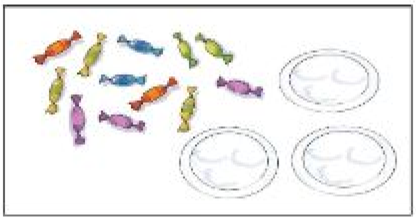
Answer: The side of the smallest square is 12 cm.

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7.2 Factors and Common Factors

Let's learn about factors.

We want to put 12 candies on some plates by dividing them equally. How many plates do you need if you do not keep any candy with you?





Let's find the answer by puting the candies on 1 plate and then keep going from 2 plates to12 plates one by one.

Number of plates	1	2	3	4	5	6	7	8	9	10	11	12
Without Remaining: ✓ With remaining: ✗	✓	✓			✗							

If we have 1 plate, we can put 12 candies on it.

If we have 2 plates, we can put 6 candies each.

If we have 5 plates, we can put 2 candies each but 2 are left.

Answer: We can put the candies on 1, 2, 3, 4, 6, 12 plates without keeping any remaining.

The numbers that can divide 12 evenly are called the **factors of 12**.
The number 12 has 6 factors:

1, 2, 3, 4, 6, and 12.

1 and the number itself are included in its factors.



I find relation between factors and multiples.
For example:

3 and 4 are the **factors** of 12,
and 12 is the **multiple** of 3 and 4.

factor

$12 = 4 \times 3$

multiple

I also find relation among each factor.

1 2 3 4 6 12

Each factor has pairs of whose product is 12.



Find and check the factors. Then exchange what you notice with your friends.

Factors of 4	1✓ 2✓ 3 4✓
Factors of 5	1 2 3 4 5
Factors of 6	1 2 3 4 5 6
Factors of 7	1 2 3 4 5 6 7 8
Factors of 13	1 2 3 4 5 6 7 8 9 10 11 12 13
Factors of 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Factors of 18	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Basically, you need to start by 1 and then go on with 2 and so on. But finding the pair of factors we can find all the factors without omission.



Factors of 18	1✓ 2✓ 3✓ 4 5 6✓ 7 8 9✓ 10 11 12 13 14 15 16 17 18✓

1 Find all the factors.

(1) 7   (2) 9   (3) 10   (4) 24   (5) 36

3 We have to divide 12 candies and 18 pieces of chocolate into equal numbers and put them on the same plates. How many plates are needed to put candies or pieces of chocolate without having any remaining?

If we have 1 plate, we can put 12 candies and 18 pieces of chocolate on it.
If we have 2 plates, we can put 6 candies and 9 pieces of chocolate each…





Oh, it's a question of factors! Let's find factors of 12 and 18.

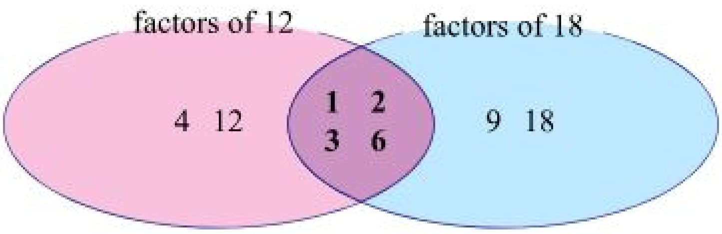
Factors of 12	1 ✓	2 ✓	3 ✓	4 ✓	5	6 ✓	7	8	9	10	11	12 ✓						
Factors of 18	1 ✓	2 ✓	3 ✓	4	5	6 ✓	7	8	9 ✓	10	11	12	13	14	15	16	17	18 ✓

If we have 3 plates, we can put 4 candies and 6 pieces of chocolate each.

If we have 4 plates, we can put 3 candies and 4 chocolates in each plate. But there will remain some chocolates.

Answer: We can arrange cadies and chocolates on 1, 2, 3 and 6 plates without having any remaining.

The numbers that are factors of both 12 and 18 are called the **common factors of 12 and 18**.
The common factors of 12 and 18 are:1, 2, 3, and 6.



4 Find the common factors of 24 and 36.



Let's compare these two ideas and explain how to do it.

Mukta



Factors of 24:	(1)	(2)	(3)	(4)	(6)	8	(12)		24
Factors of 36:	(1)	(2)	(3)	(4)	(6)	9	(12)	18	36

David



Factors of 24:	1	2	3	4	6	8	12	24
Factors of 36:	✓	✓	✓	✓	✓	×	✓	×

Answer: The common factors of 24 and 36 are 1, 2, 3, 4, 6 and 12.

The largest common factor of two numbers is called the **highest common factor (HCF)**.
The highest common factor of 24 and 36 is 12.

5 Find the common factors and the highest common factor(HCF).

(1) 4, 15

Factors of 4:	(1)	2	4	
Factors of 15:	(1)	3	5	15

Factors of 4:	1	2	4
Factors of 15:	✓	×	×

Both of the numbers have only one common factor which is 1.



(2) 9, 27

Factors of 9:	(1)	(3)	(9)	
Factors of 27:	(1)	(3)	(9)	27

Factors of 9:	1	3	9
Factors of 27:	✓	✓	✓

In this case, 9 itself is the highest common factor (HCF) of 9 and 27!

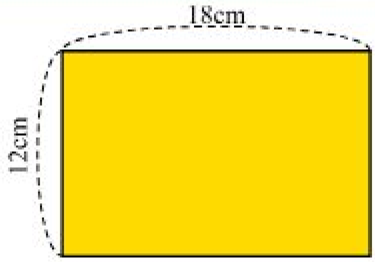


2 List all the common factors and find the highest common factors (HCF).

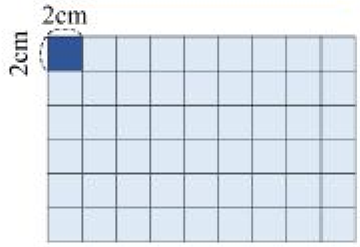
(1) 12, 20 (2) 5, 8 (3) 28, 42

(4) 8, 16, 20 (5) 15, 18, 30 (6) 12, 36, 60

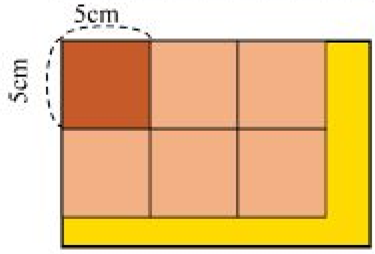
6 I have a piece of paper which is 18 cm long and 12 cm wide and I want to spread squares of the same size all over the surface of the paper.



(1) Is it possible to spread squares whose side is 2cm all over?



(2) Is it possible to spread squares whose side is 5cm all over?



(3) What relation is there between 12, 18 and the length of the side of the square?



12 is divisible by the length of the side of the square.

And 18 is also divisible by the same length.



(4) List all the possible lengths of the side of the square.



We list the common factors of 12 and 18, right?

Factors of 12:	(1), (2), (3), 4, (6), 12
Factors of 18:	(1), (2), (3), (6), 9, 18

Factors of 12:	1,	2,	3,	4,	6,	12
Factors of 18:	✓	✓	✓	×	✓	×

(5) How long is the length of the side of the biggest possible square?

In this question, the highest common factor (HCF) is very important.



7.3 Prime Numbers

Let's learn about Prime Numbers.

As the right table shows, 2, 3, 5, 7 have **only 1 and themselves as their factors.** These numbers are called **prime numbers**. 1 is not considered a prime number. Numbers that are neither 1 nor prime numbers are called **composite number**.

Factors of 18	✓1 ✓2
Factors of 18	✓1 2 ✓3
Factors of 18	✓1 2 3 4 ✓5
Factors of 18	✓1 2 3 4 5 6 ✓7

1 Let's find prime numbers up to 100.

1. Cross out 1.
2. Circle 2. Cross out all multiples of 2 that are larger than 2 itself.
3. Circle 3. Of the remaining numbers, cross out all multiples of 3 that are larger than 3 itself.
4. Continue in this way until all the remaining numbers are crossed out.



Let's do a continuance by ourselves!

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

We don't have to cross out the multiples of 4 because they are also the multiples of 2.



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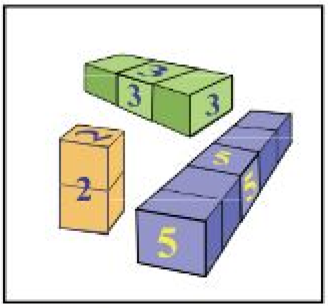
Prime numbers up to 100 are as follows:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47,
53, 59, 61, 67, 71, 73, 79, 83, 89, 97

Why do we study Prime and Composite Numbers?

Because we are able to 'break apart' composite numbers into prime number factors (**prime factors**). In other words, composite numbers can be made up by multiplication of prime numbers.

The prime numbers are the basic building blocks of all numbers.



[Example]



2, 3, 5, 7, and 11 are prime numbers.

$4=2\times2$ $12=2\times2\times3$ $20=2\times2\times5$ $42=2\times3\times7$

$81=3\times3\times3\times3$ $210=2\times3\times5\times7$ $385=5\times7\times11$

These composite numbers are made up by multiplication of prime numbers.



Put 2, 3 or 5 in the blank to make the following composite numbers.

(1) 6 = □ × □ (2) 8 = □ × □ × □

(3) 18 = □ × □ × □ (4) 30 = □ × □ × □

Let's try! divisibility of 2, 3, and 5 ---

Let's try to predict divisibility of the numbers.

1 Find the numbers which are divisible by **2**. Firstly, let's predict it. Then do division to check it.

a) 224 b) 1146 c) 2283 b) 135798



We can distinguish by looking at the number of ones place.

If there is a 0, 2, 4, 6, or 8 in the ones place, the number is a **multiple of 2**. So they are divisible by 2.

2 Find the numbers which are divisible by **5**.

a) 555 b) 354 c) 2230 d) 24685



This time, how do we find the rule?

If there is a 0 or 5 in the ones place, those numbers are a **multiple of 5**. So they are divisible by 5.

3 Choose the number which is divisible by **3**.

Hmm…Let's do division.



a) 261 b) 262 c) 263

```
    8 7          8 7          8 7
3 ) 2 6 1    3 ) 2 6 2    3 ) 2 6 3
    2 4          2 4          2 4
      2 1          2 2          2 3
      2 1          2 1          2 1
        0            1            2
```



There is a strange rule here.

261	262	263
2+6+1=9 9÷3=3 It's a multiple of 3.	2+6+2=10 10÷3=3R1 It's not a multiple of 3.	2+6+3=11 11÷3=3R2 It's not a multiple of 3.

If the sum of the digits of each place is a **multiple of 3**, the number is a multiple of 3. So it is divisible by 3.

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7.4 Exercise

1. List 3 multiples for the following numbers, ordering them from the smallest.

(1) 4 (2) 7 (3) 11 (4) 14

2. List 3 common multiples for the following pairs of numbers, ordering them from the smallest. And also write the least common multiples (LCM).

(1) 3, 4 (2) 4, 9 (3) 3, 9 (4) 5, 8

3. List all the factors of the following numbers.

(1) 9 (2) 12 (3) 24 (4) 30

4. List all the common factors of the following numbers. And also write the highest common factors (HCF) for each pair.

(1) 9, 15 (2) 14, 21 (3) 24, 40 (4) 5, 9

5. Find the least common multiples (LCM) and highest common factors (HCF) for each.

(1) 8, 12, 24 (2) 9, 12, 18

6. Put 2, 3 or 5 in the blank to make any composite number.

(1) □ × □ × □ = □ (2) □ × □ × □ × □ = □

(3) □ × □ × □ × □ = □

7. Find multiples of 2, 3 and 5 among numbers in the box.

248,	339,	121,	515,
460,	912,	751,	555,
810,	951,	131,	725

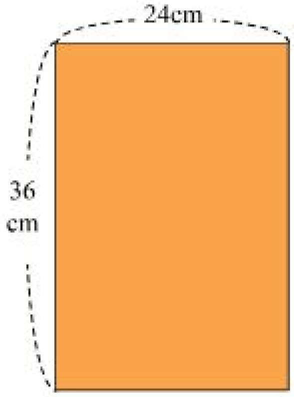
(1) multiples of 2 [ ]

(2) multiples of 3 [ ]

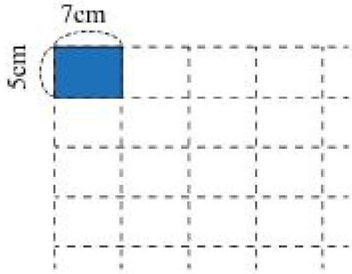
(3) multiples of 5 [ ]

8. There are two bells. Bell A rings every 8 minutes and bell B rings every 6 minutes. The bells ring together at noon. When is the next time they will ring together?

9. I have a piece of paper of 36 cm long and 24 cm wide and I want to spread squares of the same size all over the surface of the paper. How long is the length of the side of the biggest square possible?



10. We arrange rectangular tiles of 5cm long and 7 cm wide like the figure on the right to make the smallest square possible. How many cm will be the sides of the smallest square we can make?



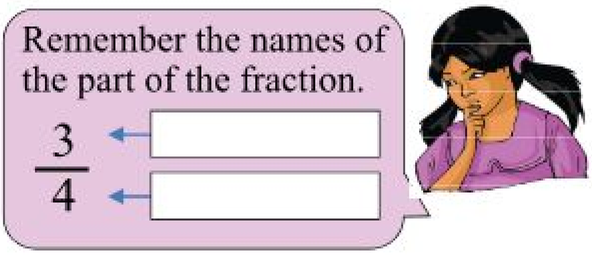
11. Rasel has 45 apples and 18 oranges. He wants to distribute the apples and oranges equally among the maximum number of children without keeping any remaining. Find the number of children. And how many apples and oranges will each child get?

Chapter Eight

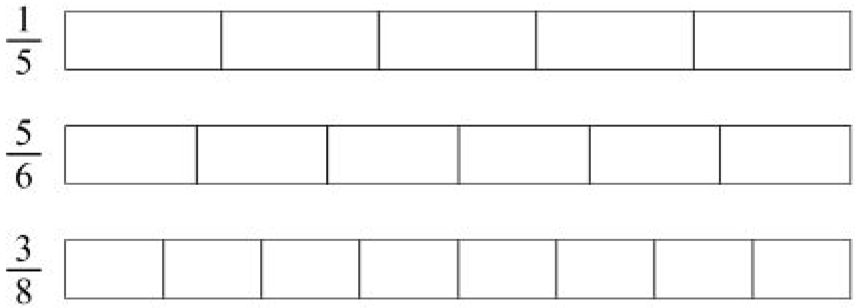
Fractions

8.1 Common fractions with the same denominator

Let's review.



1.Colour the following.



2. Put the symbols '<' or '>'.

(1) $\frac{1}{4}\square\frac{3}{4}$ (2) $\frac{2}{5}\square\frac{1}{5}$ (3) $\frac{5}{7}\square\frac{4}{7}$ (4) $\frac{8}{9}\square 1$

3. Calculate:

(1) $\frac{1}{3}+\frac{1}{3}$ (2) $\frac{2}{7}+\frac{4}{7}$ (3) $\frac{5}{6}+\frac{1}{6}$ (4) $\frac{3}{10}+\frac{7}{10}$

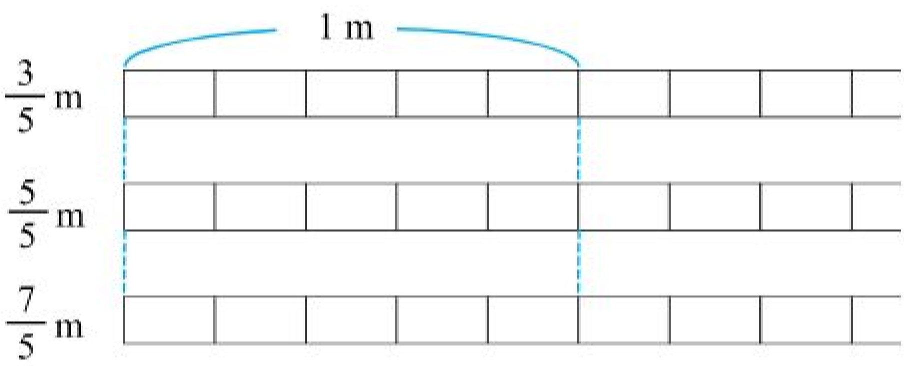
(1) $\frac{2}{3}-\frac{1}{3}$ (2) $\frac{7}{9}-\frac{5}{9}$ (3) $1-\frac{2}{3}$ (4) $1-\frac{7}{10}$

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8.2 Fractions smaller than 1, equal to 1, and larger than 1

Let's classify fractions.

Colour the following.



Fractions can be classified like this:

Fractions smaller than 1 (numerator < denominator)	**Fractions equal to 1** (numerator = denominator)	**Fractions larger than 1** (numerator > denominator)
Smaller → 3 Larger → 4 ($\frac{3}{4}$)	Equal → 4, 4 ($\frac{4}{4}$)	Larger → 5 Smaller → 4 ($\frac{5}{4}$)
$\frac{3}{4}, \frac{1}{2}, \frac{2}{3}, \frac{6}{7}$ etc.	$\frac{4}{4}, \frac{2}{2}, \frac{3}{3}, \frac{7}{7}$ etc.	$\frac{5}{4}, \frac{3}{2}, \frac{7}{3}, \frac{10}{7}$ etc.
Proper fraction	**Improper fraction**	

Fractions smaller than 1 are called **proper fractions**, while fractions equal to 1 or larger than 1 are called **improper fractions**.

In grade 4, we will mainly study **proper fraction** and **fraction equal to 1**. We are going to learn fraction larger than 1 in Grade 5.



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8.3 Comparison of fraction

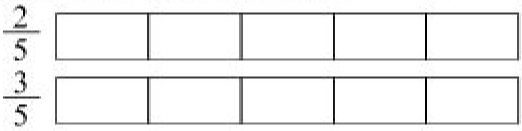
Let's find out larger fractions and smaller fractions.

Find larger or smaller. Put the symbol '<' or '>'.

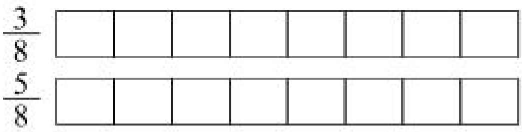
Colour and Compare.



(1) $\frac{2}{5} \square \frac{3}{5}$



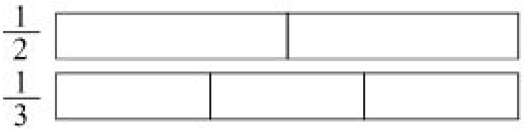
(2) $\frac{3}{8} \square \frac{5}{8}$



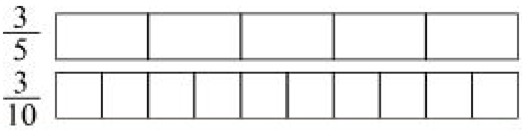
Denominators of each pair are equal.



(3) $\frac{1}{2} \square \frac{1}{3}$



(4) $\frac{3}{5} \square \frac{3}{10}$



Numerators of each pair are equal. What do you think?



If the **denominators are the same**, the fraction whose numerator is bigger is larger. (We studied it in Grade 3)
If the **numerators are the same**, the fraction whose denominator is smaller is larger.

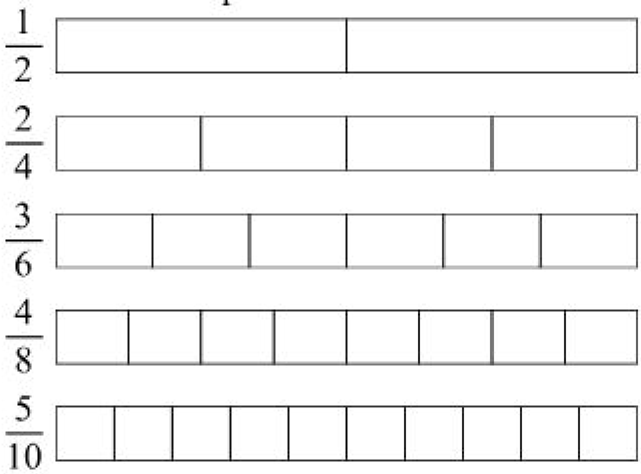
1 Arrange the following from smaller to larger and show it by symbols.

(1) $\frac{2}{3}, \frac{2}{9}, \frac{2}{8}, \frac{2}{5}$ (2) $\frac{3}{7}, \frac{3}{10}, \frac{3}{3}, \frac{3}{5}$ (3) $\frac{5}{10}, \frac{5}{6}, \frac{5}{15}, \frac{5}{9}$

8.4 Equivalent fractions

Let's find equivalent fractions and develop its idea.

1 Colour and Compare.

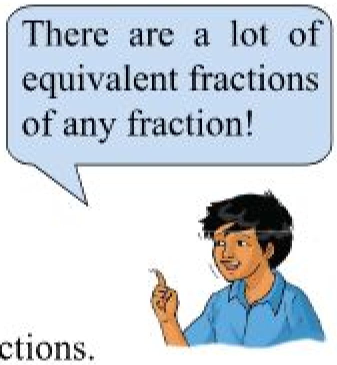




$\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ and $\frac{5}{10}$ are all equivalent fractions.

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$$

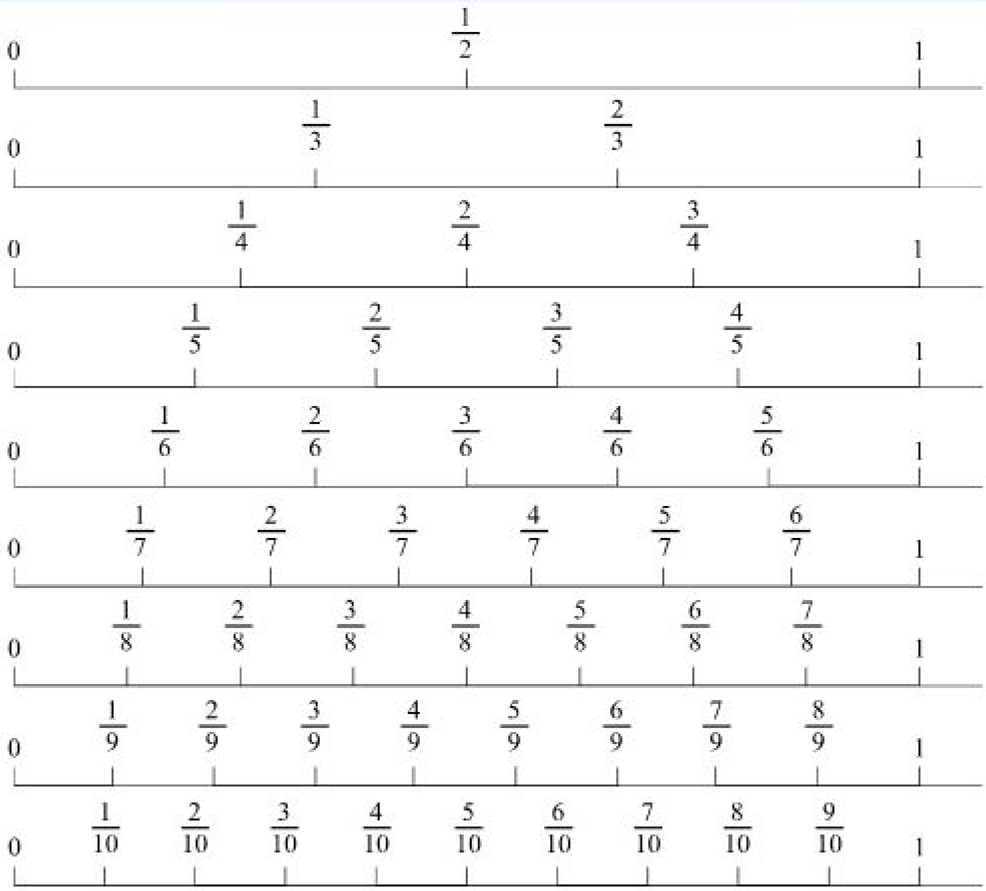
1 Using the number lines in the next page, find equivalent fractions and show it by symbol ' = '.



(1) Find equivalent fraction of $\frac{1}{3}$

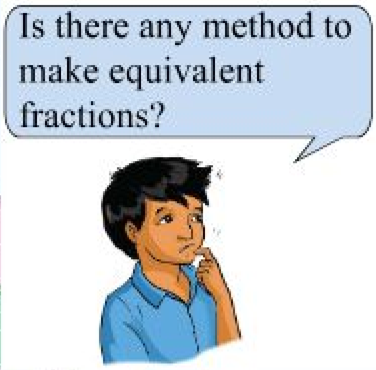
(2) Find equivalent fraction of $\frac{2}{3}$

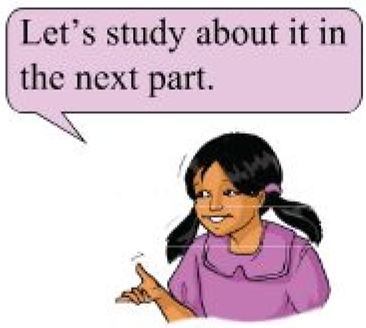
(3) Find other examples of equivalent fractions.



2 Using the number lines, find the missing numbers.

(1) $\frac{1}{4} = \frac{2}{\square}$ (2) $\frac{4}{10} = \frac{\square}{5}$ (3) $\frac{6}{9} = \frac{\square}{3}$ (4) $\frac{6}{8} = \frac{3}{\square}$





2 Think about how to make equivalent fractions of $\frac{1}{2}$

$$\frac{1}{2} \xrightarrow{\times 2} \frac{2}{4} \xrightarrow{\times \square} \frac{3}{6} \xrightarrow{\times \square} \frac{4}{8}$$

(numerator and denominator: ×2, ×□, ×□)

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$$

Equivalent fractions can be obtained by multiplying numerator and denominator of the fraction by the same number.

$$\frac{●}{■} = \frac{●\times▲}{■\times▲}$$

3 Find the missing numbers.

(1) $\frac{1}{2} = \frac{\square}{12}$ (×? on top, ×6 below) (2) $\frac{5}{6} = \frac{10}{\square}$ (3) $\frac{3}{4} = \frac{12}{\square}$ (4) $\frac{7}{8} = \frac{\square}{24}$

4 Make five equivalent fractions of $\frac{2}{5}$ freely.

3 Think about how to make equivalent fractions that are equivalent to $\frac{6}{12}$, like $\frac{3}{6}$, $\frac{2}{4}$, and $\frac{1}{2}$.

$$\frac{6}{12} \xrightarrow{\div 2} \frac{3}{6} \xrightarrow{\div \square} \frac{2}{4} \xrightarrow{\div \square} \frac{1}{2}$$

(numerator and denominator: ÷2, ÷□, ÷□)

$$\frac{6}{12} = \frac{3}{6} = \frac{2}{4} = \frac{1}{2}$$

Equivalent fractions can also be obtained by dividing numerator and denominator of the fraction by the same number.

$$\frac{●}{■} = \frac{●\div▲}{■\div▲}$$

5 Find the missing numbers .

(1) $\frac{3}{9} = \frac{\square}{3}$ (2) $\frac{6}{8} = \frac{3}{\square}$ (3) $\frac{4}{12} = \frac{1}{\square}$ (4) $\frac{8}{20} = \frac{\square}{5}$

6 Make three equivalent fractions of $\frac{12}{18}$ by dividing numerator and denominator of the fraction by the same number.



If fractions are equivalent, the simple fraction is easier…

Dividing the numerator and denominator by the same number in order to make a fraction with a smaller denominator is called **reducing a fraction.**

To reduce a fraction, divide both the numerator and the denominator by a **common factor.**



Oh, 3 is the **common factor** of 15 and 18!

$$\frac{15}{18} = \frac{5}{6} \quad (\div 3)$$

$$\frac{\cancel{15}^{\,5}}{\cancel{18}_{\,6}} = \frac{5}{6}$$

We can do like this as a simple method.



4 Reduce $\frac{16}{20}$.

$$\frac{16}{20} = \frac{8}{10} = \frac{4}{5} \quad (\div 2,\ \div 2)$$

$$\frac{\cancel{\cancel{16}^{\,8}}^{\,4}}{\cancel{\cancel{20}_{\,10}}_{\,5}} = \frac{4}{5}$$

$$\frac{\cancel{16}^{\,4}}{\cancel{20}_{\,5}} = \frac{4}{5}$$

Dividing by 2 and then by 2 is the same as dividing by 4…



And 4 is the **HCF** of 16 and 20.

While reducing fractions, we typically make the denominator as small as possible and get **the lowest term** of the fraction.

Dividing the denominator and the numerator by **the highest common factor (HCF),** we can easily get **the lowest term.**

7 Reduce the following fractions to **the lowest term**.

(1) $\frac{4}{10}$ (2) $\frac{12}{15}$ (3) $\frac{9}{27}$ (4) $\frac{24}{36}$ (5) $\frac{28}{42}$ (6) $\frac{40}{60}$

8.5 Exercise (1)

1. Find proper fractions and fractions equal to 1 in the box.

(1) proper fractions are:

( )

(2) fractions equal to 1 are:

( )

$\frac{2}{3}, \frac{4}{4}, \frac{5}{8}, \frac{8}{5}, \frac{3}{9}, \frac{13}{12}$

$\frac{27}{26}, \frac{1}{1}, \frac{76}{76}, \frac{42}{48}, \frac{2}{25}, \frac{3}{3}$

2. Arrange the following from smaller to larger and show it by symbols.

(1) $\frac{6}{7}, \frac{3}{7}, \frac{7}{7}, \frac{2}{7}$ (2) $\frac{4}{7}, \frac{4}{5}, \frac{4}{11}, \frac{4}{9}$ (3) $\frac{11}{23}, \frac{11}{13}, \frac{11}{17}, \frac{11}{91}$

3. Find the missing number.

(1) $\frac{1}{3}=\frac{\square}{6}$ (2) $\frac{3}{7}=\frac{\square}{28}$ (3) $\frac{3}{4}=\frac{\square}{36}$ (4) $\frac{4}{5}=\frac{12}{\square}$

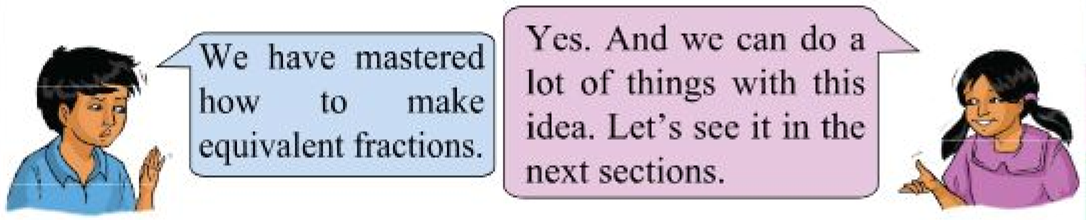
(5) $\frac{2}{9}=\frac{16}{\square}$ (6) $\frac{5}{8}=\frac{30}{\square}$ (7) $\frac{3}{6}=\frac{\square}{2}$ (8) $\frac{12}{20}=\frac{\square}{5}$

(9) $\frac{28}{36}=\frac{\square}{9}$ (10) $\frac{33}{66}=\frac{1}{\square}$ (11) $\frac{5}{65}=\frac{1}{\square}$ (12) $\frac{12}{54}=\frac{2}{\square}$

4. Reduce the following fractions to the lowest term.

(1) $\frac{6}{12}$ (2) $\frac{3}{21}$ (3) $\frac{9}{36}$ (4) $\frac{16}{48}$ (5) $\frac{8}{12}$ (6) $\frac{9}{12}$

(7) $\frac{20}{25}$ (8) $\frac{32}{36}$ (9) $\frac{18}{30}$ (10) $\frac{16}{28}$ (11) $\frac{28}{49}$ (12) $\frac{24}{40}$



8.6 Finding the common denominator

Let's study about fractions with different denominator.

1 You have $\frac{2}{3}$ m long red ribbon and $\frac{3}{4}$ m long blue one.

(1) Which one is longer ?

Why don't we convert these fractions into the ones with the **common denominator**?

Oh, yes. When the denominators are the same, then the fraction with a bigger numerator is larger.



$$\frac{\mathbf{2}}{\mathbf{3}} = \frac{4}{6} = \frac{6}{9} = \frac{8}{\mathbf{12}} \qquad \frac{8}{12} < \frac{9}{12}$$

$$\frac{\mathbf{3}}{\mathbf{4}} = \frac{6}{8} = \frac{9}{\mathbf{12}} \qquad \therefore \frac{\mathbf{2}}{\mathbf{3}} < \frac{\mathbf{3}}{\mathbf{4}}$$



Answer: Blue ribbon is longer.

(2) What is the difference of length ?



When we find the difference, we subtract: 'larger number – smaller number' . But we cannot do $\frac{\mathbf{3}}{\mathbf{4}} - \frac{\mathbf{2}}{\mathbf{3}}$. How can we do?

Wait ! Even though we cannot do directly $\frac{\mathbf{3}}{\mathbf{4}} - \frac{\mathbf{2}}{\mathbf{3}}$, we can do $\frac{\mathbf{9}}{\mathbf{12}} - \frac{\mathbf{8}}{\mathbf{12}}$.

$$\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$$



Answer: The difference is $\frac{1}{12}$ m



Wow, if we convert fractions into the fractions with **common denominator**, it will enable us not only to find larger or smaller of the fractions but also do subtraction and addition!

OK. Firstly let's study how to find a **common denominator**. And then convert fractions into fractions with common denominator.



2 Convert $\frac{3}{5}$ and $\frac{2}{3}$ into fractions with common denominators.

$$\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20} \longrightarrow 5, 10, 15, 20...$$

$$\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15} \longrightarrow 3, 6, 9, 12, 15...$$

Do you remember what these numbers are called?



Oh! Yes, 15 is the multiple of both 3 and 5. Moreover 15 is also the least common multiples (LCM) of 3 and 5!



To find a common denominator of the fractions at a time:

1. Find a common multiple of the denominators.
2. Convert the fractions so that they have the same denominator.

We typically use the **least common multiples (LCM)** of the original denominators.

Answer: $\left[\frac{3}{5}, \frac{2}{3}\right] \longrightarrow \left[\frac{9}{15}, \frac{10}{15}\right]$

1 Convert into fractions with common denominators.

(1) $\left[\frac{1}{3}, \frac{1}{4}\right] \longrightarrow [\quad]$ (2) $\left[\frac{2}{3}, \frac{1}{2}\right] \longrightarrow [\quad]$

(3) $\left[\frac{1}{2}, \frac{2}{5}\right] \longrightarrow [\quad]$ (4) $\left[\frac{1}{3}, \frac{2}{5}\right] \longrightarrow [\quad]$

(5) $\left[\frac{1}{2}, \frac{1}{4}\right] \longrightarrow [\quad]$ (6) $\left[\frac{3}{4}, \frac{5}{6}\right] \longrightarrow [\quad]$

(7) $\left[\frac{7}{9}, \frac{5}{12}\right] \longrightarrow [\quad]$ (8) $\left[\frac{1}{3}, \frac{1}{4}, \frac{1}{2}\right] \longrightarrow [\quad]$

(9) $\left[\frac{1}{2}, \frac{2}{3}, \frac{1}{5}\right] \longrightarrow [\quad]$ (10) $\left[\frac{3}{5}, \frac{3}{4}, \frac{7}{10}\right] \longrightarrow [\quad]$

2 Convert into the fractions with common denominators and compare with the symbols '<' , '>' or '='.

(1) $\frac{7}{9} \square \frac{5}{12}$ (2) $\frac{3}{4} \square \frac{5}{7}$ (3) $\frac{2}{3} \square \frac{6}{9}$ (4) $\frac{11}{16} \square \frac{17}{24}$

Now, we have mastered how to convert fractions into the fractions with common denominator.





OK, let's apply this idea to addition and subtraction of fractions with different denominators.

8.7 Addition and Subtraction of Fractions

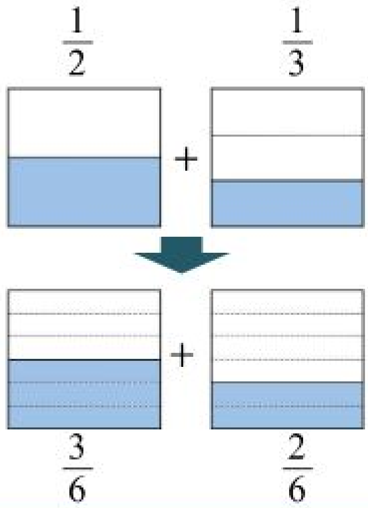
1 The bottle A has $\frac{1}{2}$ litre of water and B has $\frac{1}{3}$ litre of water.

How many litres of water are in two bottles?



We are calculating the total amount. So, the operation must be □.





Mathematical sentence: $\frac{1}{2} + \frac{1}{3}$

Calculation:

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6}$$

$$= \square$$

Answer: $\frac{5}{6}$ litre.

To add fractions with different denominators, firstly convert fractions into fractions with common denominator and then calculate.

1 Add using fractions with common denominators:

(1) $\frac{1}{4} + \frac{1}{3} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

(2) $\frac{1}{4} + \frac{2}{5} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

(3) $\frac{1}{6} + \frac{2}{9} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

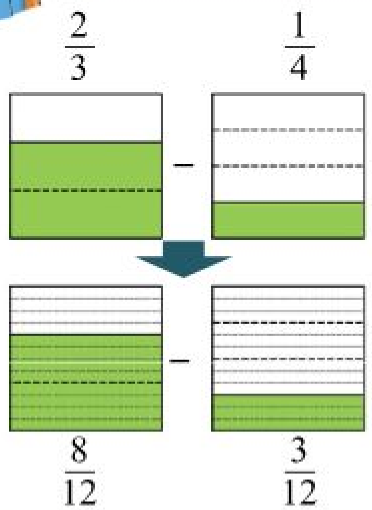
(4) $\frac{1}{8} + \frac{5}{6}$

2025

2 You have $\frac{2}{3}$ litre of milk and you've drunk $\frac{1}{4}$ litre. How many litres are left?



It's a problem about a remainder; So, the operation is ☐.



Mathematical sentence: $\frac{2}{3} - \frac{1}{4}$

Calculation:

$$\frac{2}{3} - \frac{1}{4} = \frac{8}{12} - \frac{3}{12}$$

$$= \square$$

Answer: $\frac{5}{12}$ litre.

To subtract fractions with different denominators, first we convert fractions into the fractions with common denominator and then calculate.

1 Subtract using fractions with common denominators:

(1) $\frac{1}{2} - \frac{1}{3} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(2) $\frac{1}{4} - \frac{1}{5} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(3) $\frac{2}{3} - \frac{2}{5} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(4) $\frac{3}{8} - \frac{1}{4} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

(5) $\frac{5}{6} - \frac{3}{8}$

(6) $\frac{7}{10} - \frac{4}{15}$

3 Do calculation.

(1) $\frac{1}{3}+\frac{1}{6}$

$$\frac{1}{3}+\frac{1}{6}=\frac{2}{6}+\frac{1}{6}=\frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{6}}}=\frac{1}{2}$$

(2) $\frac{1}{2}-\frac{1}{6}$

$$\frac{1}{2}-\frac{1}{6}=\frac{3}{6}-\frac{1}{6}=\frac{\overset{1}{\cancel{2}}}{\underset{3}{\cancel{6}}}=\frac{1}{3}$$

If possible, reduce the fraction to its **lowest term**.

2 Do addition and subtraction.

We must be careful not to forget reducing.



(1) $\frac{1}{4}+\frac{3}{20}$ (2) $\frac{1}{4}+\frac{7}{12}$ (3) $\frac{3}{8}+\frac{1}{24}$ (4) $\frac{4}{15}+\frac{1}{12}$ (5) $\frac{8}{15}+\frac{3}{10}$

(6) $\frac{11}{14}-\frac{2}{7}$ (7) $\frac{1}{2}-\frac{1}{6}$ (8) $\frac{5}{6}-\frac{7}{18}$ (9) $\frac{11}{12}-\frac{4}{15}$ (10) $\frac{13}{15}-\frac{9}{20}$

4 Do calculations with three fractions.

(1) $\frac{1}{6}+\frac{1}{3}+\frac{1}{4}$

$$\frac{1}{6}+\frac{1}{3}+\frac{1}{4}=\frac{2}{12}+\frac{4}{12}+\frac{3}{12}=\frac{\overset{3}{\cancel{9}}}{\underset{4}{\cancel{12}}}=\frac{3}{4}$$

(2) $1-\frac{1}{2}-\frac{1}{4}$

$$1-\frac{1}{2}-\frac{1}{4}=\frac{4}{4}-\frac{2}{4}-\frac{1}{4}=\frac{1}{4}$$

8.8 Exercise (2)

1. Convert into fractions with common denominators and compare with the symbols '<' , '>' or '='.

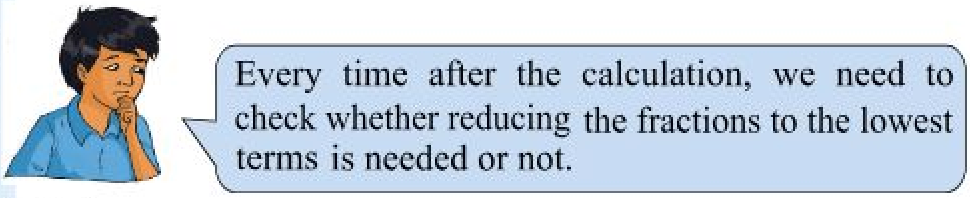
   (1) $\frac{1}{3}\square\frac{1}{5}$ (2) $\frac{3}{4}\square\frac{5}{6}$ (3) $\frac{5}{7}\square\frac{6}{9}$ (4) $\frac{3}{4}\square\frac{12}{16}$ (5) $\frac{3}{24}\square\frac{7}{72}$

2. Add :

   (1) $\frac{1}{4}+\frac{1}{2}$ (2) $\frac{2}{5}+\frac{3}{7}$ (3) $\frac{1}{6}+\frac{3}{8}$ (4) $\frac{3}{7}+\frac{1}{3}$ (5) $\frac{2}{9}+\frac{5}{12}$

   Do these carefully

   (6) $\frac{5}{6}+\frac{1}{10}$ (7) $\frac{2}{3}+\frac{2}{15}$ (8) $\frac{1}{6}+\frac{2}{15}$ (9) $\frac{4}{15}+\frac{2}{5}$ (10) $\frac{1}{6}+\frac{7}{12}$



3. Subtract :

   (1) $\frac{1}{3}-\frac{1}{4}$ (2) $\frac{5}{6}-\frac{2}{5}$ (3) $\frac{1}{3}-\frac{1}{6}$ (4) $\frac{4}{9}-\frac{1}{6}$ (5) $\frac{11}{12}-\frac{7}{9}$

   Do these carefully

   (6) $\frac{9}{10}-\frac{2}{5}$ (7) $\frac{7}{12}-\frac{1}{4}$ (8) $\frac{4}{15}-\frac{1}{6}$ (9) $\frac{2}{3}-\frac{7}{15}$ (10) $\frac{9}{10}-\frac{5}{6}$

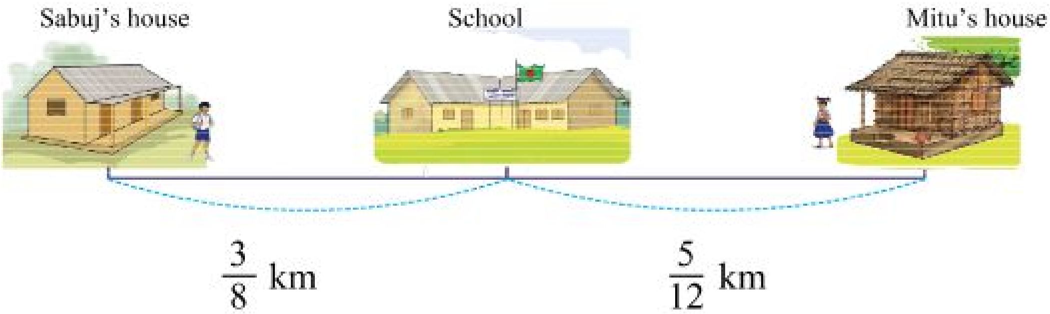
4. Calaulate :

   (1) $\frac{1}{3}+\frac{1}{4}+\frac{1}{12}$ (2) $\frac{1}{6}+\frac{1}{3}+\frac{2}{9}$ (3) $\frac{1}{2}-\frac{1}{3}-\frac{1}{9}$ (4) $\frac{3}{4}-\frac{3}{5}+\frac{1}{2}$

5. Fill in the blank boxes:

(1) $\frac{\square}{3}+\frac{1}{5}=\frac{13}{15}$ (2) $\frac{5}{7}+\frac{\square}{5}=\frac{32}{35}$ (3) $\frac{5}{6}-\frac{\square}{7}=\frac{23}{42}$

6. Sabuj's house is $\frac{3}{8}$ km to the west of the school. Mitu's house is $\frac{5}{12}$ km to the east of her house.



(1) How far is Mitu's house from Sabuj's house?

(2) Whose house is nearer to school? What is the difference of the distance from Sabuj's house and Mitu's house to the school?

7. A farmer planted brinjal in $\frac{1}{2}$ part, cabbage in $\frac{1}{4}$ part and flowers in $\frac{1}{5}$ part of his garden.



(1) How much part of the garden did he plant?

(2) How much part of the garden remained empty?

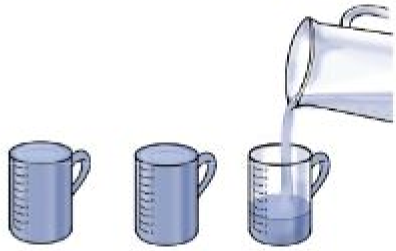
Chapter Nine

Decimals

9.1 Decimals

Let's learn another method to represent the fraction amount.

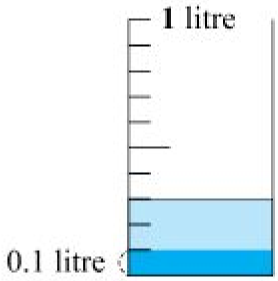
There is some water in a jug. The water is poured into three mugs of one litre each.The third mug is not full as the picture shows. How much water is there in the third mug?



When we represent the fractional amount, we often use $\frac{1}{10}$ of the original unit.

The volume of $\frac{1}{10}$ of 1 litre is '**0.1** litre', and in words it is written and read as '**zero point one** litre'.

0.1 litre = $\frac{1}{10}$ litre



The third mug contains $\frac{3}{10}$ litre.

$\frac{3}{10}$ litre is **three times of 0.1** litre. So,it's **0.3** litre.

In the jug, there was **2 litres and 0.3 litre** of water which can be represented by **2.3 litres** and read as **two point three** litres in words.

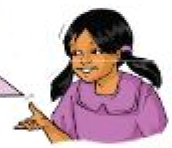
Numbers such as 0.1, 0.3, 2.3 and so on are called **decimals** and "." is called a **decimal point**.

Name of the place	one	tenths
	2	3
How to read	two point	three

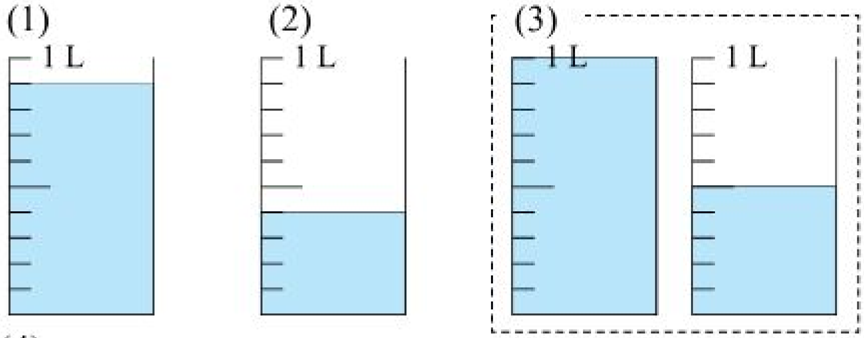
The place to the right of the decimal point is called:

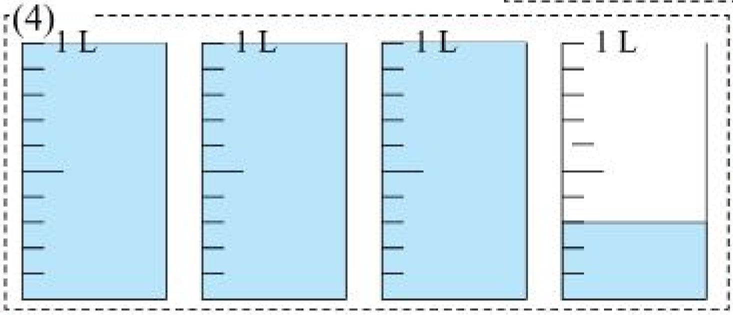
the **tenths place** ($\frac{1}{10}$ s place).

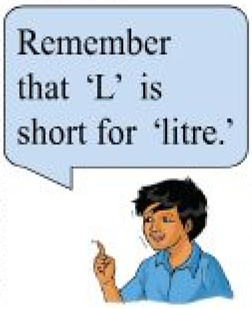
In contrast, numbers which we have studied such as 0, 1, 2, and so on, without fraction part, are called **integers**.



1 Represent the following volumes using decimals and write in words.







2 Classify these numbers in decimals and integers

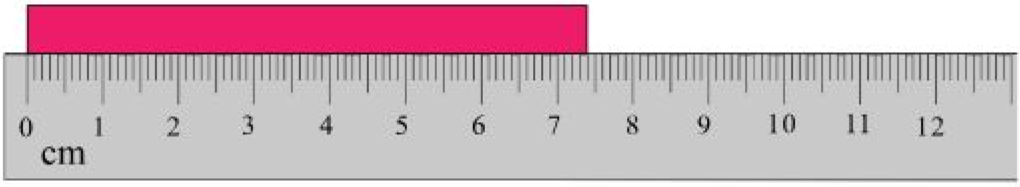
0.6	1.7	2
4	11.3	36.8

Decimals	
Integers	

2 How many centimetres is the length of the red tape?

Remember that 'cm' is short for 'centimetre' and "mm" is short for 'millimetre.'





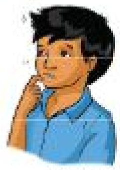
(1) What is the length of the tape? [cm mm]

(2) How many cm is 1 mm? [cm]

1 mm is $\frac{1}{10}$ **cm** so…

(3) How can you write 4 mm in cm? [cm]

(4) How can you write 7 cm 4 mm in cm? [cm]



3 The weight of the oranges in the picture is 1 kilogram and 500 gram. What is the weight of the oranges?



'kg' is short for 'kilogram' and 'g' is short for 'gram.'



(1) How can you write 100g in kg? [kg]

Remember that 1000 gram is equivalent to 1 kilogram.



(2) How can you write 500g in kg? [kg]

(3) How can you write 1kg and 500g in kg? [kg]

We use decimals in many situations in our daily life. Let's learn more about decimals.

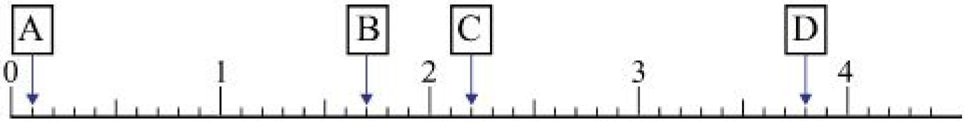


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9.2 Size of decimals

Let’s compare the size of decimals.

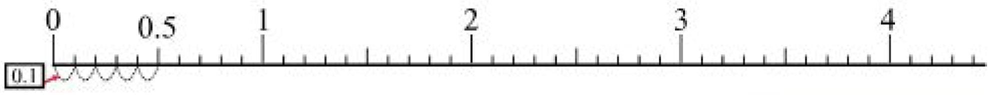
1.What numbers are represented for A, B, C and D on the number line?



2. Put these numbers on the number line above.

0.9, 0.5, 2.6, and 3.2

3. How many 0.1s consist of 0.5, 1.8 and 3.3?



4. Answer the following questions.

a) Write the number made of twenty five 0.1s.

b) Write the number made of twenty 0.1s.

c) How many 0.1s make 3.2?

d) How many 1s and 0.1s make 3.2?

“2.0” can be expressed as “2.”



5. Which is larger, 2.1 or 1.3?


Rita

I put these numbers on the number line to compare their size. The number on the right is larger.



2.1 is made of twenty one 0.1s.
1.3 is made of thirteen 0.1s. So, 2.1 > 1.3.


Jogen

1 Which is larger? Write‘<’ or‘>’.

(1) 2.4 ☐ 1.8 (2) 3 ☐ 0.8 (3) 7.1 ☐ 6.8 (4) 0 ☐ 0.1

2 Which is larger, $\frac{2}{10}$ or 0.3?







$\frac{2}{10}$ is made of two 0.1s.

0.3 is made of three 0.1s.

$\therefore \frac{2}{10} < 0.3$

$\frac{2}{10}$ is made of two $\frac{1}{10}$.

0.3 is made of three $\frac{1}{10}$ s.

$\therefore \frac{2}{10} < 0.3$



0	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	1
0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

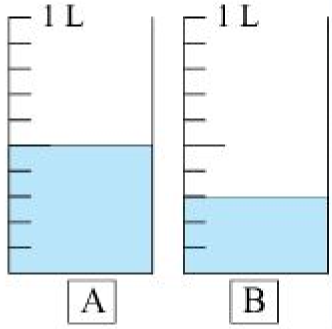
1 Which is larger? Represent with Relation Symbols (<, > or =).

(1) $\frac{8}{10}$ ☐ 0.7 (2) 0.3 ☐ $\frac{3}{10}$ (3) 0.1 ☐ $\frac{3}{10}$ (4) $\frac{10}{10}$ ☐ 0.9

9.3 Addition and Subtraction of Decimals (1)

Let's try addition and subtraction of decimals.

Container A has 0.5 litre of water and container B has 0.3 litre of water.



(1) How many litres of water are there in two bottles?



To find total amount, we choose ______.

Mathematical sentence is:__________



Let's think about how many 0.1s are there in the numbers.

Calculation is…

0.5 is made of five 0.1s and 0.3 is made of three 0.1s. In all, there are (5 + 3) 0.1s. ∴ The answer is: 0.8 litre

(2) How much more water is there in A than B?



To find difference in the amount of water, we choose ______ .

Mathematical sentence is:__________

Calculation is…

(five 0.1s) − (three 0.1s) So difference is (5 − 3) 0.1s. ∴ The answer is: 0.2 litre

1 Do addition and subtraction.

(1) $0.3 + 0.4$ (2) $0.7 + 0.2$ (3) $0.5 + 0.5$ (4) $0.9 + 0.3$

(5) $0.8 - 0.6$ (6) $0.7 - 0.2$ (7) $1 - 0.3$ (8) $1.6 - 0.4$

As we see, if we think about how many 0.1s are there in the numbers, we can calculate in almost the same way as of integers.





So we can do vertical calculation!

$$\begin{array}{r} 1.9 \\ +\ 2.3 \\ \hline 4.2 \end{array} \qquad \begin{array}{r} 2.4 \\ -\ 0.6 \\ \hline 1.8 \end{array}$$

Yes, and it's important to line up the places properly.

The rules of the vertical calculation:

1. Line up the places vertically.
2. Calculate in the same way as addition and subtraction of integers.
3. Place a decimal point in the answer, lining it up with the decimal points above.



And we must be careful about some more points.

2 Do addition and subtraction.

(1) 1.3 + 2.7

✓ $\begin{array}{r} 1.3 \\ +\ 2.7 \\ \hline 4.\not{0} \end{array}$

1.3 + 2.7 = 4.0

But we write it just as 4.

✓ 1.3 + 2.7 = 4

(2) 7 + 5.5

✗ $\begin{array}{r} 7 \\ +\ 5.5 \\ \hline 6.2 \end{array}$ ✓ $\begin{array}{r} 7.0 \\ +\ 5.5 \\ \hline 12.5 \end{array}$

Think about 7 as 7.0.

(3) 5 − 0.3

✗ $\begin{array}{r} 5 \\ -\ 0.3 \\ \hline 0.2 \end{array}$ ✓ $\begin{array}{r} 5.0 \\ -\ 0.3 \\ \hline 4.7 \end{array}$

Think about 5 as 5.0.

(4) 3.6 − 2.8

$\begin{array}{r} 3.6 \\ -\ 2.8 \\ \hline \text{✗}\ \ 0.8 \end{array}$ $\begin{array}{r} 3.6 \\ -\ 2.8 \\ \hline \text{✓}\ \ 0.8 \end{array}$

Don't forget to put '.' and '0' in ones place.

9.4 Exercise (1)

1.Which one is larger? Express them with Relation Symbols (<, > or =).

(1) 0.4 ☐ 0.7 (2) 5.6 ☐ 6.5 (3) 0.1 ☐ 0 (4) 11 ☐ 1.1

(5) $\frac{5}{10}$ ☐ 0.5 (6) 0.7 ☐ $\frac{3}{10}$ (7) 0.1 ☐ $\frac{1}{10}$ (8) $\frac{10}{10}$ ☐ 1

2. Addition and Subtraction:

(1) $0.6 + 0.4$ (2) $0.8 + 0.5$ (3) $0.6 + 0.7$ (4) $1.8 + 0.2$

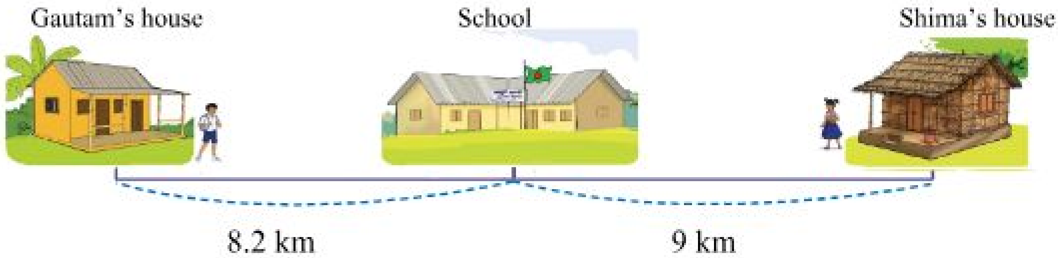
(5) $0.7 - 0.4$ (6) $1 - 0.2$ (7) $1.2 - 0.3$ (8) $2 - 0.4$

3. Do vertical calculation.

(1) $\begin{array}{r} 1.2 \\ +3.6 \\ \hline \end{array}$ (2) $\begin{array}{r} 2.8 \\ +1.5 \\ \hline \end{array}$ (3) $\begin{array}{r} 4.7 \\ +3.9 \\ \hline \end{array}$ (4) $\begin{array}{r} 3 \\ +6.8 \\ \hline \end{array}$ (5) $\begin{array}{r} 4.1 \\ +3.9 \\ \hline \end{array}$

(6) $\begin{array}{r} 3.4 \\ -1.3 \\ \hline \end{array}$ (7) $\begin{array}{r} 5 \\ -2.8 \\ \hline \end{array}$ (8) $\begin{array}{r} 7.6 \\ -1.6 \\ \hline \end{array}$ (9) $\begin{array}{r} 6.3 \\ -5.5 \\ \hline \end{array}$ (10) $\begin{array}{r} 9.1 \\ -8.9 \\ \hline \end{array}$

4. Gautam's house is 8.2 km to the west of the school. Shima's house is 9 km to the east of her house.



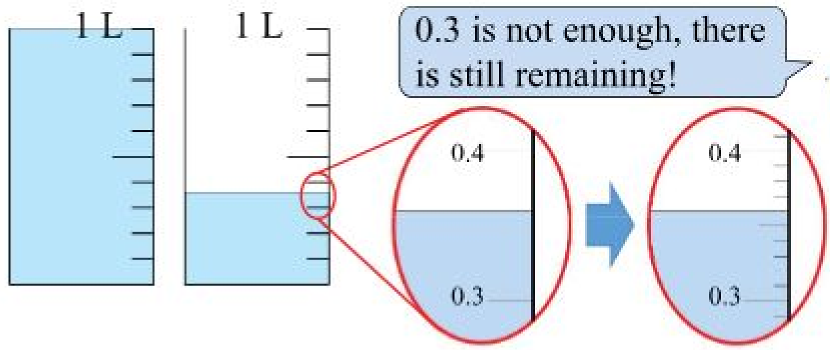
(1) How far is Shima's house from Gautam's house?

(2) How many kilometres are the distance from school to Shima's house than the distance from school to Gautam's house?

9.5 Hundredths and Thousandths place

Let's study how to represent the smaller decimal.

How can we represent the following amount of water?



0.3 is not enough, there is still remaining!



We need to divide 0.1 litre into 10 equal parts.



$\frac{1}{10}$ of **1** litre —— **0.1** litre

$\frac{1}{10}$ of **0.1** litre —— **0.01** litre(**zero point zero one** litre)

And **0.01** litre is $\frac{\mathbf{1}}{\mathbf{100}}$ of **1** litre.



Total amount is:

one 1 litre —— . litre

three 0.1s litre —— . litre

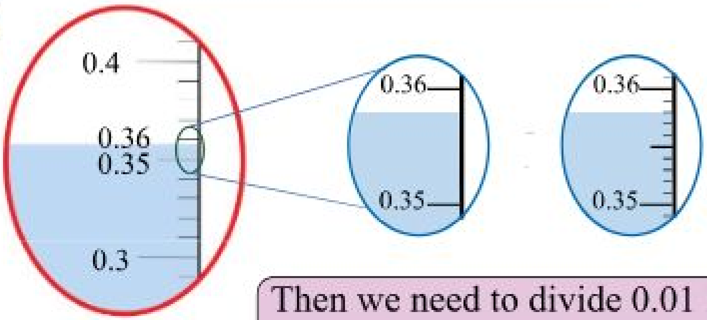
six 0.01s litre —— . litre

1 . 3 6 litre

(**one point three six** litre)



Then what if there is much smaller amount? For example…



Then we need to divide 0.01 litre into 10 equal parts.



$\frac{1}{10}$ of **0.01** litre —— **0.001** litre **(zero point zero zero one** litre**)**



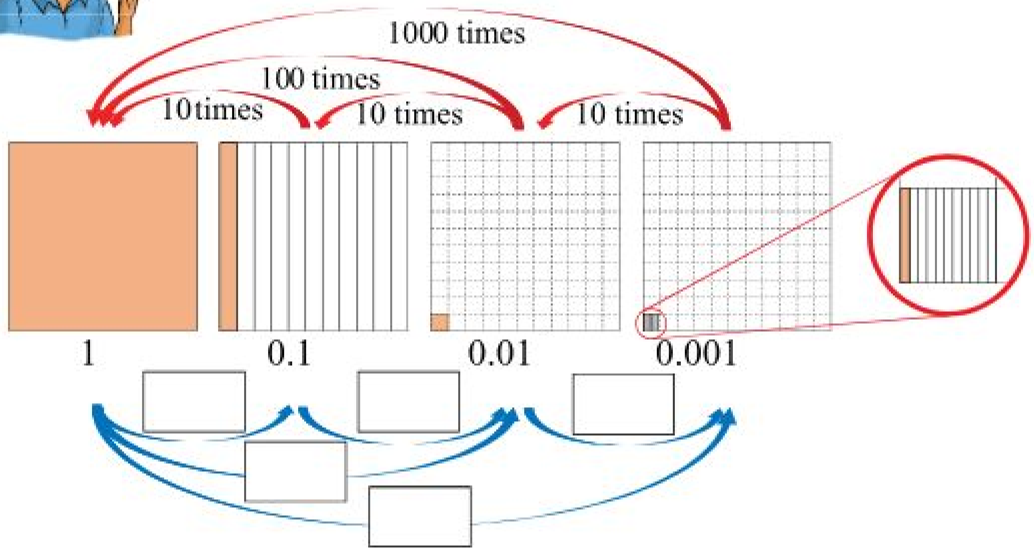
And **0.001** litre is $\frac{1}{1000}$ of 1litre.

In this case,
there are **eight 0.001** litre. So
Total amount is: 1.358 litre

Name of the place	one	tenth ($\frac{1}{10}$s)	**hundredths** ($\frac{1}{100}$s)	**thousandths** ($\frac{1}{1000}$s)
	1	**3**	**5**	**8**
How to read	one point	three	five	eight

The place to the right of the **thenths place** is called
the **hundredths place** ($\frac{1}{100}$s place).
The place to the right of the **hundredths place** is called
the **thousandths place** ($\frac{1}{1000}$s place).





Each numeral in the decimal has a fixed place and is 10 times of the right or $\frac{1}{10}$ of the left.

2. How many 1s, 0.1s, 0.01s, and 0.001s are combined in the following numbers?

(1) 1.469 (2) 3.825 (3) 0.017

1.469 combines		3.825 combines		0.017 combines	
one	1s		1s		1s
four	0.1s		0.1s		0.1s
	0.01s		0.01s		0.01s
	0.001s		0.001s		0.001s

3

1. How many 0.01s are combined to make these numbers?

(1) 0.23 (2) 4.23 (3) 8.07 (4) 11.46 (5) 11.4

Let's think about how many 0.01s are there in the numbers.





Three 0.01s is 0.03…
Twenty-three 0.01s is 0.23…
Four hundred and twenty-three 0.01s is 4.23…

2. How many 0.001s are combined to make these numbers?

(1) 0.015 (2) 0.478 (3) 2.075 (4) 4.23

Be careful.

1

Answer the questions.

a) Write the number made of one hundred and fifty five 0.01s.

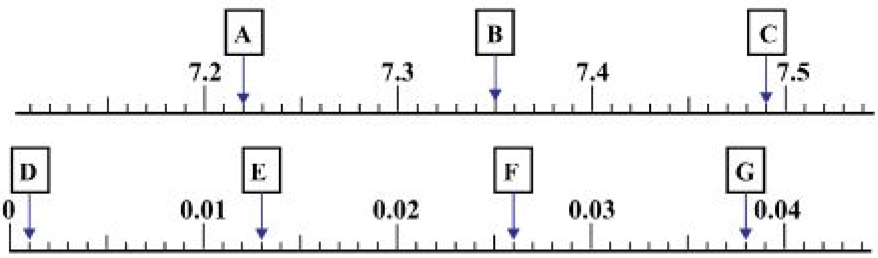
b) Write the number made of one hundred and fifty five 0.001s.

c) How many 0.01s make 6.82?

d) How many 0.001s make 6.82?

2

1. What numbers are represented for A to G on the number line?



2. Represent these numbers on the number line.

0.001, 0.015, 0.027, 0.034



4 Multiply 0.56 by 10 and 100. And also divide it by 10.



> 0.56 is made by combining fifty six 0.01s. So…

10 times 0.56 equals to:
56 of 10 times 0.01 ➡ 56 of 0.1 ➡ 5.6

100 times 0.56 equals to:
56 of 100 times 0.01 ➡ 56 of 1 ➡ 56

0.56 divided by 10 equals to:
56 of 0.01 divided by 10 ➡ 56 of 0.001 ➡ 0.056

tens	ones	tenths $(\frac{1}{10})$	hundredths $(\frac{1}{100})$	thousandths $(\frac{1}{1000})$
5	6			
	5 .	6		
	0 .	5	6	
	0 .	0	5	6

10 times
10 times
100 times
$\frac{1}{10}$

Each place in a decimal number increases by one place when you multiply by 10 and decreases by one place when you divide by 10.

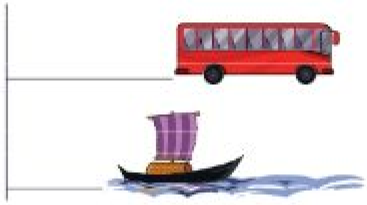
3 Multiply the following numbers by 10. And also divide them by 10.

(1) 0.6 (2) 0.49 (3) 1.11 (4) 7.32

9.6 Addition and Subtraction of Decimals (2)

Let's try calculation with hundredths and thousandths place.

1 Samson traveled 5.52 kilometres by bus and 2.65 kilometres by boat. How much path did he travel in total?





To find total amount, the operation is ______.

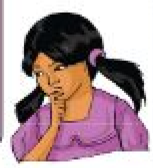
Mathematical sentence: ____________

Calculation is…

$$\begin{array}{r} 5.52 \\ +\,2.65 \\ \hline 8.17 \end{array}$$

Answer: 8.17 kilometers

Let's think about how many 0.01s are there in the numbers.
We can calculate in almost the same way as of integers.



2 Hasan's bag weighs 4.8 kilogram and Ripa's weighs 3.59 kilogram.
What is the difference of weight between their bags in kilogram?





When we calculate difference we use ______.

Mathematical sentence: ____________

Calculation

$$\begin{array}{r} 4.80 \\ -\,3.59 \\ \hline 1.21 \end{array}$$

Line up the places. And Think about 4.8 as 4.80.



Answer: The difference is 1.21 kilograms

Do addition and subtraction carefully.

(1) 4.06 + 2.94

$$\begin{array}{r} ✓\ 4.06 \\ +\ 2.94 \\ \hline 7.\cancel{0}\cancel{0} \end{array}$$

4.06 + 2.94 = 7.00
But we write it just as 7.
✓ 4.06 + 2.94 = 7

(2) 6 + 4.85

$$\begin{array}{r} ×\quad 6 \\ +\ 4.85 \\ \hline 4.91 \end{array} \qquad \begin{array}{r} ✓\ 6.00 \\ +\ 4.85 \\ \hline 10.85 \end{array}$$

Think about 6 as 6.00.

(3) 4 − 2.31

$$\begin{array}{r} ×\quad 4 \\ -\ 2.31 \\ \hline 2.33 \end{array} \qquad \begin{array}{r} ✓\ 4.00 \\ -\ 2.31 \\ \hline 1.69 \end{array}$$

Think about 4 as 4.00.

(4) 3.75 − 0.5

$$\begin{array}{r} 3.75 \\ -\ \ 0.5\ \\ \hline ×\ 3.70 \end{array} \qquad \begin{array}{r} 3.75 \\ -\ 0.50 \\ \hline ✓\ 3.25 \end{array}$$

Think about 0.5 as 0.50.

(5) 7.58 − 6.87

$$\begin{array}{r} 7.58 \\ -\ 6.87 \\ \hline ×\quad 71 \end{array} \qquad \begin{array}{r} 7.58 \\ -\ 6.87 \\ \hline ✓\ 0.71 \end{array}$$

Don't forget to put "." and "0" in ones place.

1 Do vertical calculations.

(1) $\begin{array}{r} 3.27 \\ +\ 2.51 \\ \hline \end{array}$ (2) $\begin{array}{r} 0.28 \\ +\ 6.72 \\ \hline \end{array}$ (3) $\begin{array}{r} 4.07 \\ +\ 3.6\ \ \\ \hline \end{array}$ (4) $\begin{array}{r} 3.141 \\ +\ 5.379 \\ \hline \end{array}$

(5) $\begin{array}{r} 5.47 \\ -\ 3.25 \\ \hline \end{array}$ (6) $\begin{array}{r} 8.26 \\ -\ 3.4\ \ \\ \hline \end{array}$ (7) $\begin{array}{r} 4.\ \ \ \ \\ -\ 2.25 \\ \hline \end{array}$ (8) $\begin{array}{r} 7.652 \\ -\ 6.648 \\ \hline \end{array}$

2025

9.7 Decimal and Fraction

Let's try to convert decimals into fractions and vice-versa.

Express 0.3, 0.15, and 0.008 as fractions.

$$0.3 = \frac{\square}{10}$$

$$0.15 = \frac{\square}{100}$$

$$0.008 = \frac{\square}{1000}$$

We have studied,

$$0.1 = \frac{1}{10}$$

$$0.01 = \frac{1}{100},$$

$$0.001 = \frac{1}{1000}$$



We can express decimals as fractions by using 10, 100, 1000 and so on in the denominator.

Then if possible, reduce the answer to get the lowest term.

$$0.15 = \frac{\overset{3}{\cancel{15}}}{\underset{20}{\cancel{100}}} = \frac{3}{20} \qquad 0.008 = \frac{\overset{\overset{1}{\cancel{2}}}{\cancel{8}}}{\underset{\underset{125}{\cancel{250}}}{\cancel{1000}}} = \frac{1}{125}$$

1 Convert the decimals into fractions. And if possible, reduce the answer to get the lowest term.

(1) 0.55 (2) 0.04 (3) 0.75 (4) 0.25



Then I think we can also express fractions as decimals in the same way, by using 10, 100, 1000 and so on in the denominator.

1. Express $\frac{3}{10}, \frac{27}{100}, \frac{341}{1000}$ as decimals.

$$\frac{3}{10} = 0.3 \qquad \frac{27}{100} = 0.27 \qquad \frac{341}{1000} = 0.341$$

2. Express $\frac{3}{20}, \frac{7}{25}, \frac{17}{50}$ as decimals.

How about making equivalent fraction with 10, 100, 1000 and so on in a denominator? $\frac{3}{20} = \frac{15}{100}$ (× 5)



$$\frac{3}{20} = \frac{3 \times 5}{20 \times 5} = \frac{15}{100} = 0.15$$

$$\frac{7}{25} = \frac{7 \times 4}{25 \times 4} = \frac{28}{100} = 0.28$$

$$\frac{17}{50} = \frac{17 \times 2}{50 \times 2} = \frac{34}{100} = 0.34$$



Can we convert $\frac{1}{3}$ into decimals?

I think it's difficult. But at the secondary level, we may solve it.



We can express fractions as decimals by using 10, 100, 1000 and so on in the denominator, but not for all the fractions.

2 Convert the fractions into decimals.

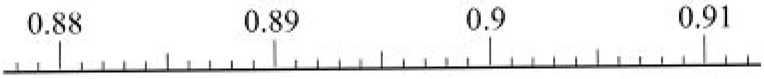
(1) $\frac{7}{20}$ (2) $\frac{11}{25}$ (3) $\frac{37}{50}$ (4) $\frac{1}{4}$

2025

9.8 Exercise (2)

1. Represent these numbers on the number line.

0.881, 0.889, 0.895, 0.899, 0.901



2. How many 0.001s are combined to make these numbers?

(1) 0.031 (2) 0.296 (3) 1.047 (4) 1.03

3. Multiply the following numbers by 10. And also divide them by 10.

(1) 0.6 (2) 0.49 (3) 1.11 (4) 7.32

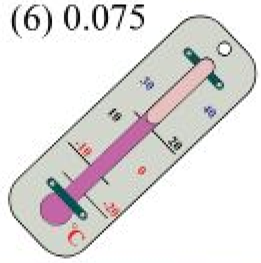
4. Do vertical calculation.

(1) $\begin{array}{r} 3.57 \\ +1.24 \\ \hline \end{array}$ (2) $\begin{array}{r} 4.38 \\ +3.7 \\ \hline \end{array}$ (3) $\begin{array}{r} 6.25 \\ +1.55 \\ \hline \end{array}$ (4) $\begin{array}{r} 0.82 \\ +2.39 \\ \hline \end{array}$ (5) $\begin{array}{r} 3.079 \\ +0.921 \\ \hline \end{array}$

(6) $\begin{array}{r} 5.38 \\ -2.19 \\ \hline \end{array}$ (7) $\begin{array}{r} 8.65 \\ -0.7 \\ \hline \end{array}$ (8) $\begin{array}{r} 7.2 \\ -5.37 \\ \hline \end{array}$ (9) $\begin{array}{r} 9 \\ -0.42 \\ \hline \end{array}$ (10) $\begin{array}{r} 1.467 \\ -0.397 \\ \hline \end{array}$

5. Convert the fractions into decimals and decimals into fractions. If possible, reduce the fraction to get the lowest term.

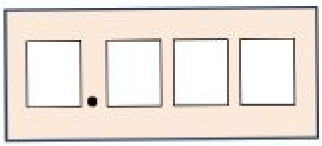
(1) $\frac{3}{25}$ (2) $\frac{17}{50}$ (3) $\frac{3}{4}$ (4) 0.6 (5) 0.25 (6) 0.075



6. Yesterday's highest temperature was 32.55° Celsius and today's is 28.87°. Find the difference?

7. You have the following four cards. Now make decimals using the format on the right.

1 3 5 0



(1) What is the largest number you can make?
(2) What is the smallest number you can make?

Chapter Ten

Measurement

10.1 Length and Perimeter

Let’s convert the unit of lengths: km, m ,cm, and mm.

Let’s review relation among the unit of length.



km (kilometre)	m (metre)	cm (centimetre)	mm (millimetre)
1 km =	1000 m		
	1 m =	100 cm	
		1 cm =	10 mm
			1 mm

The height of Monindra Tripura is 1 m 42 cm

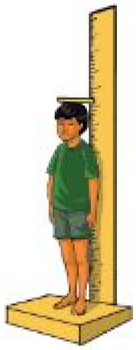
(1) Express in ‘cm.’

1 m =100 cm ∴1 m 42 cm = **142 cm**

(2) Express in ‘m.’

10 cm = 0.1 m → 40 cm = 0.4 m
1 cm = 0.01 m → 2 cm = 0.02 m

∴1 m 42 cm = **1.42 m**



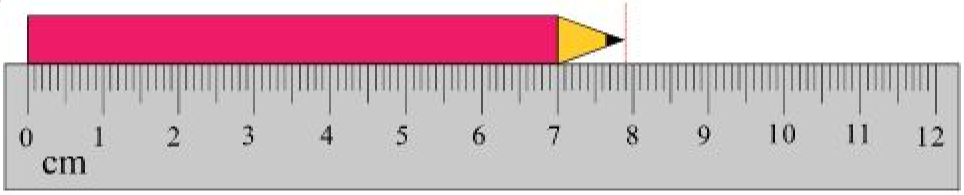
1 Express these lengths in ‘m’ and ‘cm.’

3 m 78 cm → ☐ m, ☐ cm

2 m 6 cm → ☐ m, ☐ cm

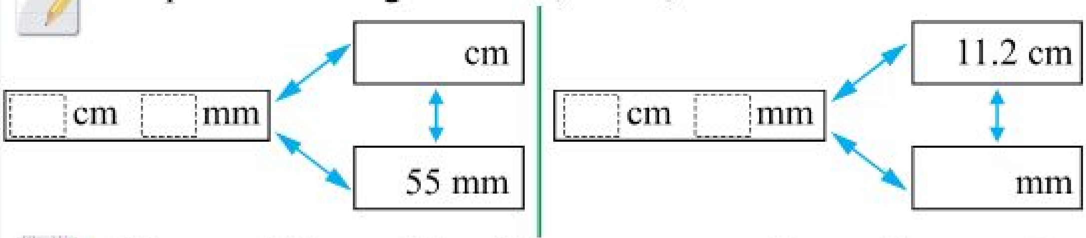
Be careful.

Example 2 Express the length of the pencil in 'cm' and 'mm'.



The length of the pencil: 7.9 cm / 79 mm

2 Express these lengths in "cm," "mm," and in both.



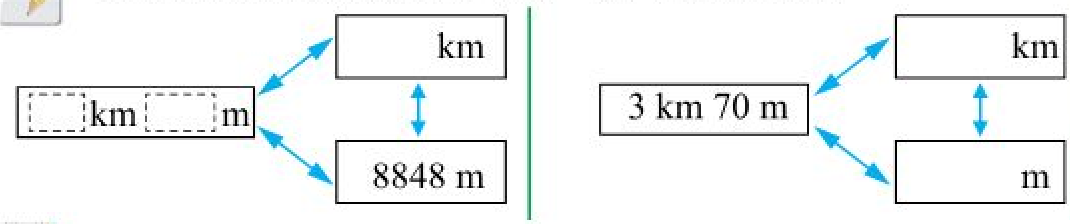
3 Measure different objects from your surrounding environment (e.g. book, stick, table, brick,etc.) and express in "m," "cm," and "mm."

Example 3 Express 3796 metres in "km."

3000 m	=	☐ km
700 m	=	0.7 km
90 m	=	☐ km
6 m	=	0.006 km
∴ 3796 m	=	**3.796 km**



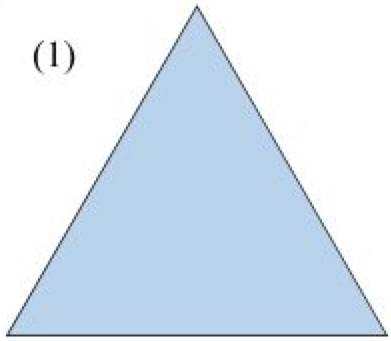
4 Express these lengths in 'km,' 'm,' and in both.



5 For a marathon, a runner runs 42.195 km. Express 42.195 km in 'm'.

4 Measure the total length of the sides of each shape using cm scale.

(1)



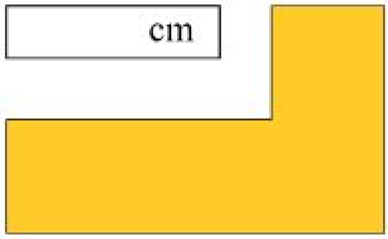
[ ] cm

(2)



[ ] cm

(3)

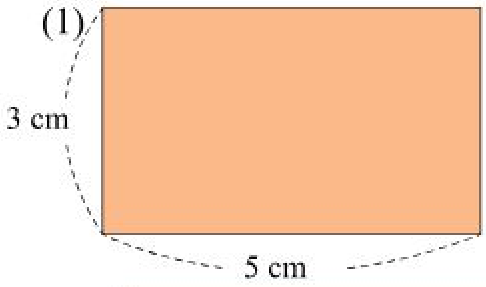


[ ] cm

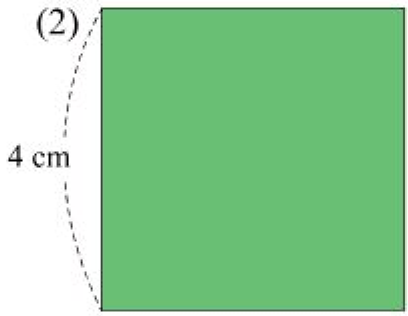
The total distance around the sides of the figure is called **perimeter.**

5 Find the perimeter of the following rectangular and square.

(1)



(2)







$(3 + 5) \times 2 =$ [ ]

[ ] cm

$4 \times 4 =$ [ ]

[ ] cm

6 Measure and calculate perimeter of the shapes around you.

10.2 Weight

Let's convert the unit of weight: kg and g.

kg (kilogram)	**g** (gram)
1 kg	= 1000 g



The back pack weighs 8245g. Let's convert the unit of weight from g into kg.

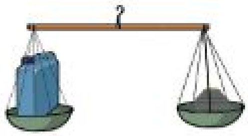
8000 g	=	8 kg
200 g	=	☐ kg
40 g	=	0.04 kg
5 g	=	☐ kg
∴ 8245 g	=	**8.245 kg**

You weigh something with a set of standard weights.



How heavy are they? Express in "kg" and "g"

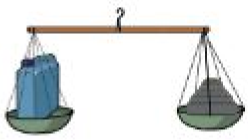
(1)



500 g, 200 g, 50 g, 10 g

☐ kg
☐ g

(2)



1 kg, 500 g, 200 g, 100 g, 20 g, 10 g, 5 g

☐ kg
☐ g

1 Express the weights in "kg," "g," and in both.

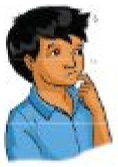
☐ kg ☐ g ↔ 5.062 kg ↔ ☐ g

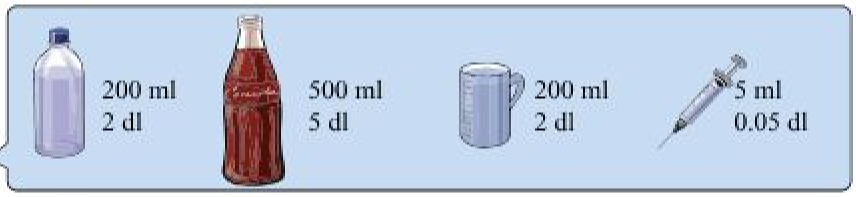
10 kg 900 g ↔ ☐ kg ↔ ☐ g

10.3 Volume of liquid

Let's learn a new unit of volume of liquid and use it.

To weigh small amount of liquid, we use "deciliter (dl)" and "millilitre (ml)."





L (litre)	**dl** (deciliter)	**ml** (millilitre)
1 L =	10 dl =	1000 ml
	1 dl =	100 ml

We also use 'cc' as a unit of volume of liquid.
1cc = 1ml
(cc = cubic centimeter)



Kazol bought 1L of milk and drank 250 ml of it. How much milk is left?



1L = 1000 ml
So
1000 − 250 = 750
Answer: **750 ml**



250 ml = 0.25 L
So
1 − 0.25 = 0.75
Answer: **0.75 L**

Both are correct. Dipika expresses it in **millilitre** and Arun expresses it in **litre**.

1. Express these volume in 'L,' 'ml,' in both and 'dl'.

1.5 L	☐ L ☐ ml	☐ dl	☐ ml
☐ L	☐ L ☐ ml	☐ dl	350 ml

10.4 Exercise (1)

1. Fill in the blank boxes.

(1) 8 mm = ☐ cm

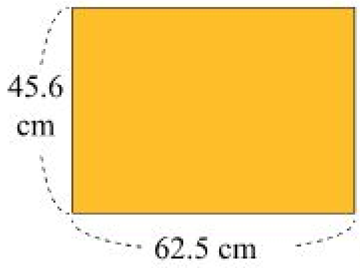
(2) 4.2 km = ☐ m

(3) 5.45 L = ☐ ml = ☐ dl

(4) 3 m 7 cm = ☐ cm

(5) 600 g = ☐ kg

2. Length and width of the surface of Apu's desk are 62.5 cm and 45.6 cm. How long is the perimeter of the table? Express in "cm" and "m."



cm	m

3. Hasan bought 1.5 kg of meat for his family. After they had eaten some of them, 895 g remained. How much meat did they eat? Express it in "kg" and "g."



kg	g

4. Shampa drank 340 ml of water for breakfast, 380 ml for lunch, and 300 ml for dinner. How much water did she drink in total? Express in "ml" , "dl" and "L."

ml	dl	L

5. The distance from Arun's house to his uncle's is 9.8 km. He walks 950m. to the bus stop and travels 6.5 km on a bus. How far is left to reach his uncle's house? Express in "km" and "m."

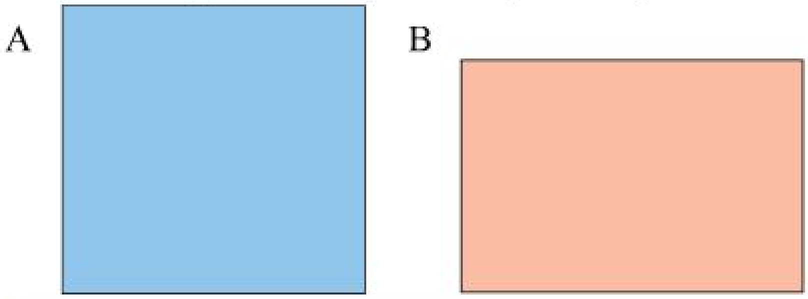
km	m

10.5 Area

Let's think about how to describe size of the surface.

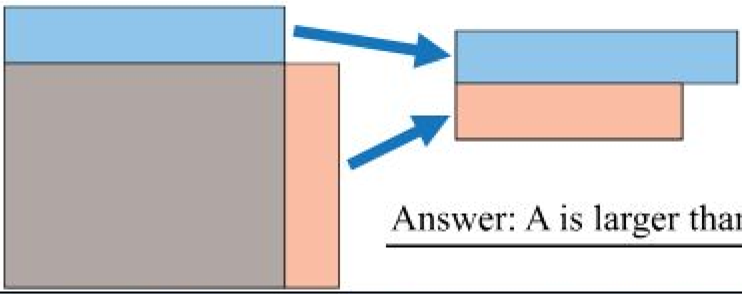


Which one is larger, A or B? How do you compare?





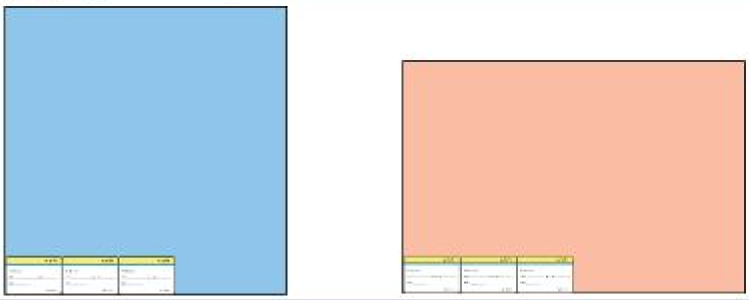
Um…the basic way is to cut them off or trace them on a piece of thin paper, then overlap them to compare.



Answer: A is larger than B.



If we cannot cut off or trace them, we can spread something on the surface and compare on the basis of the amount the object object occupies

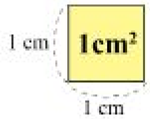


Yes, but I don't think "these" are enough. We need a specific unit of international standard.



The amount of space inside the boundary of a flat object is called "**area**". Area is expressed in terms of the **number of squares with 1 cm on each side.**

The area of square with 1 cm each side is called **1 square centimeter** and written as**1cm²**. **cm²** is a unit of area.



1 cm²

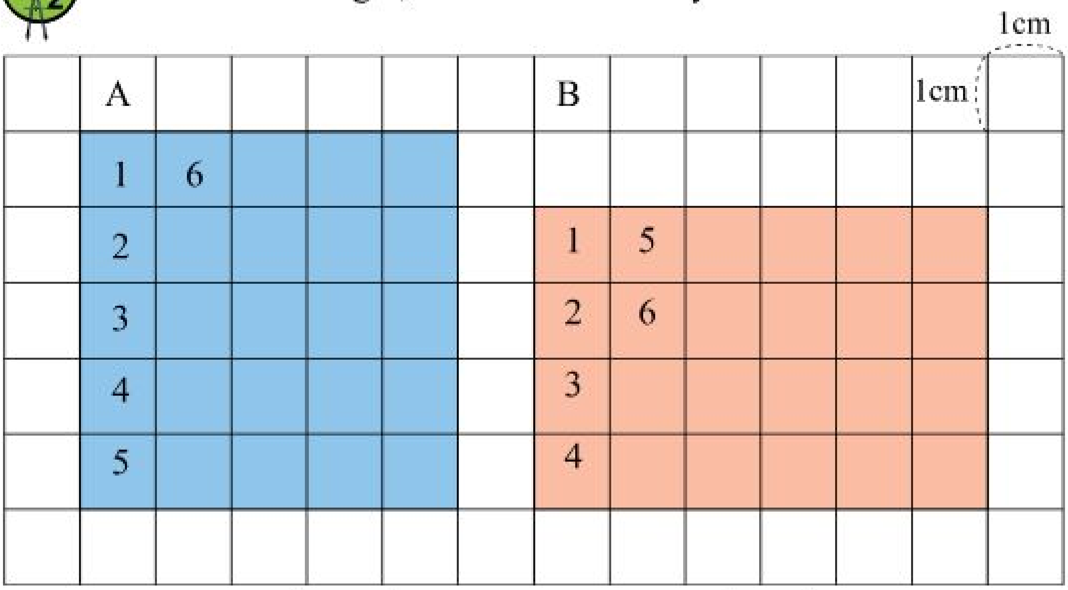


We can spread squares of 1cm² on the surface and count the number to find the area.

Yes. But we can also think about it with the graph paper spacing of 1 cm ×1cm.



Which one is larger, A or B? How many cm² is the difference?

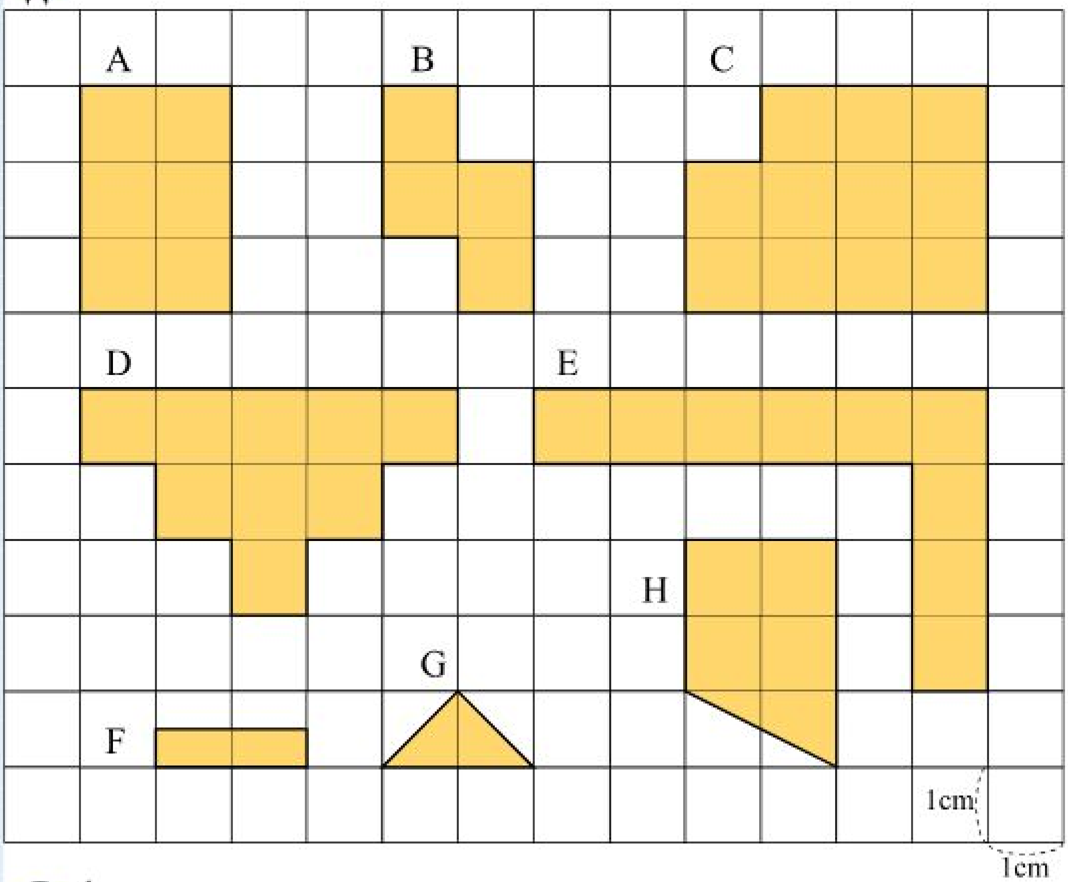


The area of A is [25] 1 cm², so its area is [ ] cm².

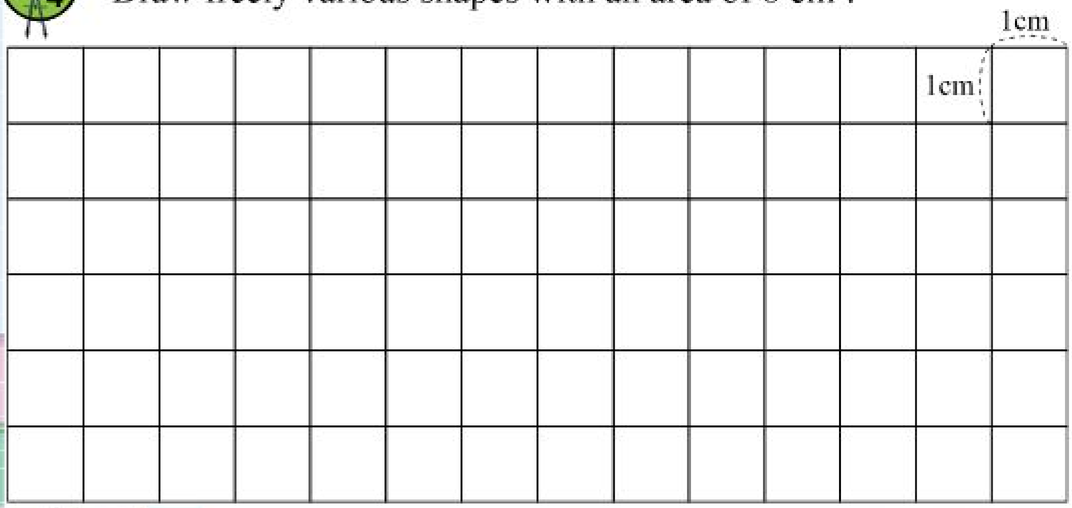
The area of B is [ ] 1 cm², so its area is [ ] cm².

Answer: [ ] is bigger than [ ] by [ ] cm²

3 What is the area of each of the shapes below in cm^2?



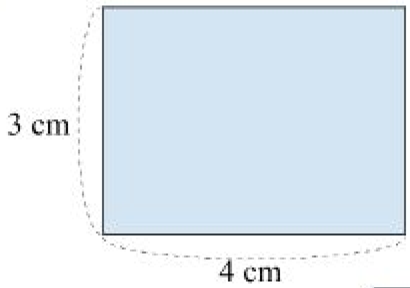
4 Draw freely various shapes with an area of 8 cm^2.

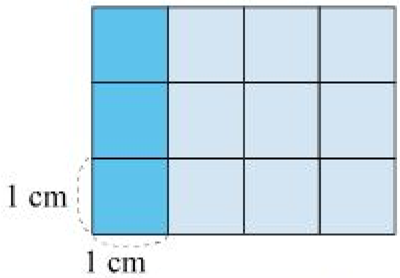


We count the number of squares of $1cm^2$ to figure out the area. So, I think the area can be estimated with some calculation.



5 Think about how to find the area of following rectangle with calculation.



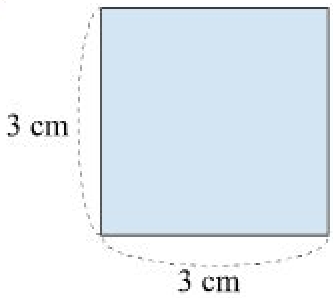


There are 4 columns of 3 squares stacked vertically.



Mathematical sentence is: ☐ × ☐ = ☐ Answer is: ☐ cm^2

6 Find the area of following square with calculation.



Mathematicl sentence is: ___________

Area of the square is: _____ cm^2

The formulas for finding the area of rectangles and squares are below:

Area of a rectangle = length × width

Area of a square = 1 side × 1 side

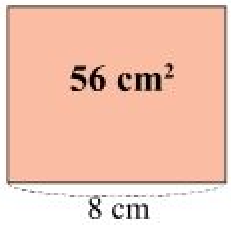
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1 Find the area using the formula.

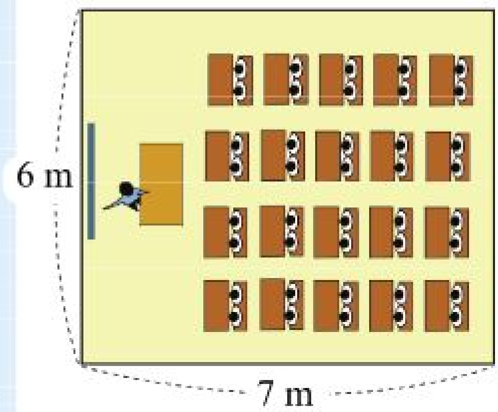
(1) The rectangle of 21 cm long and 15cm wide.

(2) The square with 10 cm sides.

2 What is the width of the rectangle on the right?



This is the size of Ripa's classroom. Find the area of the floor.



Let's use the formula. But before the calculation, we need to convert the unit.

6 m= 600 cm

7 m = 700 cm

Area is: $600 \times 700 = 420000$

Answer: $420000\ cm^2$

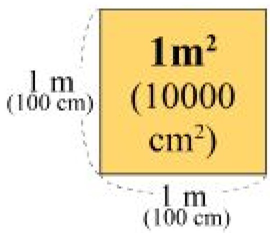
But the number is quite large…





Wow, great! You're right, and have mentioned good point, Reza!
In this case, we can use another unit.

We can use the area of a square with **1 m** sides.
It is **1 square metre**, and written as $\mathbf{1m^2}$.
$\mathbf{m^2}$ is a basic unit of area.



$1\ m^2$

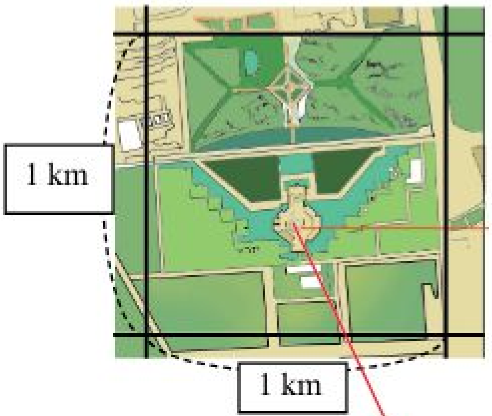
Mathematical sentence: $6 \times 7 = 42$

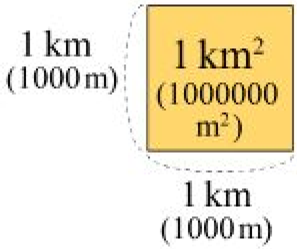
Answer: $42\ m^2$



As Reza found, $42\ m^2 = 420000\ cm^2$
Because $1\ m^2 = 10000\ cm^2$ ($100\ cm \times 100\ cm$)

8 This is the part of the map of the area near the National Parliament Building in Dhaka. One side of the square is 1 km.
How do you express the area?





1 km^2



The unit used for large areas of land like towns and districts is the area of a square with **1 km** sides.
It is **1 square kilometre**, and written as **1km^2**

3 A football field is rectangular in shape, and length of the longer side is 100 m and the width is 70 m. Find the area of the field.

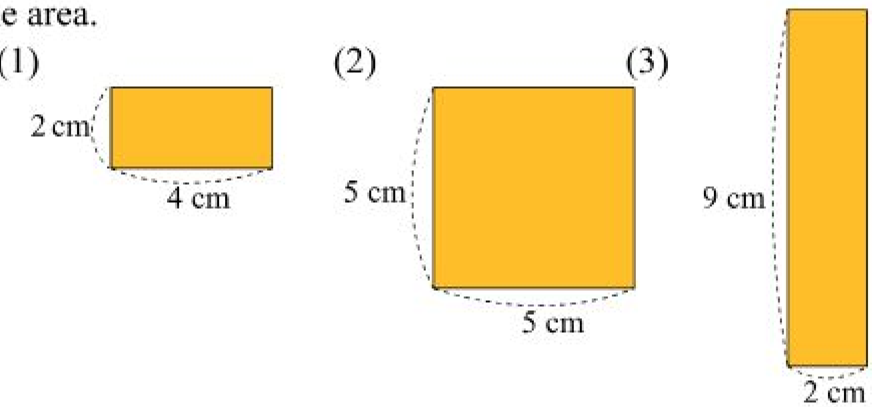
4 Estimate the area of the rectangular piece of land that runs 2 km east-west and 3 km north-south.

5 Calculate the area of the square piece of land with 10 km sides.

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10.6 Exercise (2)

1. Find the area.



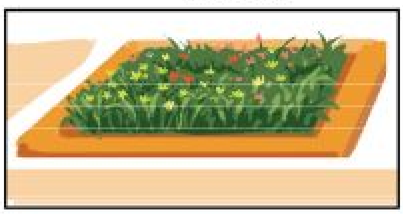
2. What is the length of the rectangular flowerbed below?



3. Find the area.
   (1) A blackboard with 5 m length and 80 cm width.
   (2) The surface of the rectangular table with a width of 150 cm and a width of 2 m.
   (3) A rectangular piece of land that runs 2 km east-west and 500 m north-south.

4. Connect the dots.

(A) Area of a surface of the desk	•	•	200 km^2
(B) Area of a flowerbed	•	•	2250 cm^2
(C) Area of a town	•	•	320 m^2



Chapter Eleven
Time

11.1 Time

Let's convert the unit of time and add and subtract the time.

Let's review relation among the unit of time.



year	month	week	day	hour	minute	second
1 year ↔	12 months					
	1 month ↔	4 weeks (or, 4 weeks and 2 or 3 days)				
		1 week ↔	7 days			
			1day ↔	24 hours		
				1 hour ↔	60 minutes	
					1 minute ↔	60 seconds

Let's convert 1 hour, 1 day, and 1 week into seconds.

1 minute is 60 seconds, so…



(1) 1 hour = 60 minute = 60×60 second = <u>3600 second</u>

(2) 1 day = 24 hour = $24 \times$ <u>3600 second</u> = <u>86400 second</u>

(3) 1 week = 7 day = $7 \times$ <u>86400 second</u> = 604800 second

1 Convert day and week into minutes.

1 hour is 60 minutes, so…



(1) 1 day = 24 hour = [ ] minutes

(2) 1 week = [ ] = [ ] = [ ] minutes

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2 Express the following periods in hour.

(1) 3 day (2) 1 week

(3) 9 weeks and 6 days

1 day is 24 hours and
1 week is 7days, so…



(1) 3 days = 3 × 24 hours = 72 hours <u>72 hours</u>

(2) 1 week = 7 days = 7 × 24 hours = 168 hours <u>168 hours</u>

(3) 9 weeks and 6 days = 9 × 7 days + 6 days
= 63 days + 6 days
= 69 days
= 69 × 24 hours
= 1656 hours <u>1656 hours</u>

3 Sajjad and Shohag are two brothers. The age of Sajjad is 14 years 5 months and the age of Shohag is 9 years 9 months. What is the difference between their ages?



As we find the difference, the operation should be ☐.

Why don't we subtract every unit? We first subtract smaller unit and then in order like calculation of integers.



	year	month
	~~14~~ 13	5 (+12)
−	9	9
		8

[month]
5 − 9, but we cannot do it, so move 1 year (= 12 months) and subtract 9 from 17.
17 − 9 = 8

	year	month
	~~14~~ 13	5
−	9	9
	4	8

[year] 13 − 9 = 4

The difference is: **4 years 8 months**

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4 As of September, 2014, world records of men's marathon and women's marathon are as follows.

men's marathon	2:02:57 (2 hours 2 minutes 57 seconds)
women's marathon	2:15:25 (2 hours 15 minutes 25 seconds)

(1) What's the difference between these two?





We can subtract every unit. We subtract smaller unit first and then in order.

	hour	minute	second
	2	~~15~~ 14	25 (+60)
−	2	2	57
		12	28

[second]
25 − 57, but we cannot do it, so move 1 minute (= 60 seconds) and subtract 57 from 85.
85 − 57 = 28

[minute] 14 − 2 = 12

[hour] 2 − 2 = 0

The difference is: **12 minutes 28 seconds**

(2) How do we calculate if we need to add these two times?

	hour	minute	second
	2	2 (+1)	57
+	2	15	25
	4	18	22

[second]
57 + 25 = 82,
and 82 = 60 + 22 . so carry 1 minute.

[minute] 2 + 15 (+1) = 18

[hour] 2 + 2 = 4

The total is: **4 hour 18 minutes 22 seconds**

11.2 Exercise

1. Express in seconds.

2 minutes = 120 seconds	10 minutes = seconds
4 minutes = seconds	5 minutes = seconds
12 minutes = seconds	20 minutes = seconds

2. Express in days.

48 hours = 2 days	2 weeks = days
72 hours = days	3 weeks = days
120 hours = days	4 weeks = days

3. Add together and change them into hours and minutes.

	minute	hour and minute
50 minutes + 30 minutes	80 minutes	1 hour and 20 minutes
35 minutes + 35 minutes		
60 minutes + 80 minutes		
90 minutes + 45 minutes		
120 minutes + 60 minutes		

4. Salma is 10 years 9 months old and the age of Mita is 12 years 0 months. What is the difference between their ages?

5. Masuda Begum is entitled to get leave for 3 months 3 weeks 6 days. She took leave for 2 months 3 weeks 3 days. How many days' leave can she take more? (1 month = 30 days)



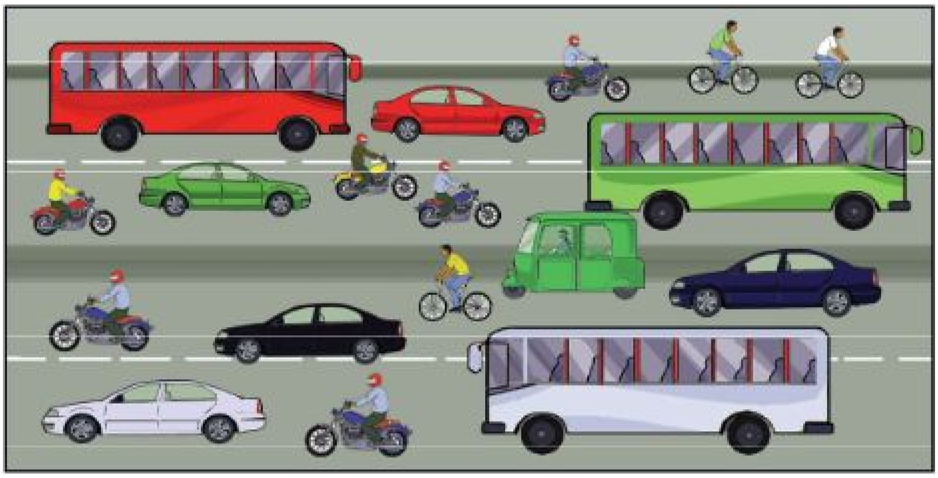
Chapter Twelve

Collection and Arrangement of Data

12.1 Making tables

Let's try to arrange the data on the table.

Let's think about how to count the number of the vehicles passing in front of us.



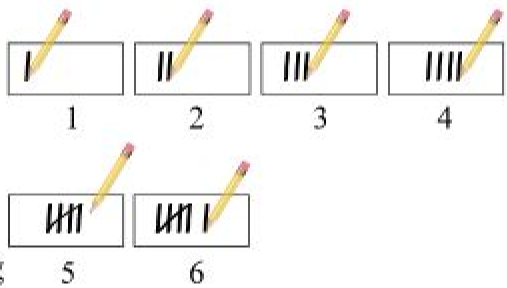


We need to make a record. Otherwise we may forget the number.

Then let's use **tally marks.**



Tally marks are a quick way to keep track of numbers in groups of five. One vertical line is made for each of the first four numbers, but the fifth line is drawn across the previous four. Then we continue making single marks again.
This is very easy to count by using **Tally marks**.



2 We would like to express the number of the vehicles on the table with tally marks. Let's complete the table on the right.

Name of vehicles	Tally marks
Bicycle	III
Standard vehicle	
Mortor cycle	
Bus	
CNG	

3 Now let's convert tally marks into numeral characters to remake the table. And add the total number.

(1) Which one of the vehicles is mostly used?

(2) Which one of the vehicles is least used?

Name of vehicles	Number
Bicycle	3
Standard vehicle	
Mortor cycle	
Bus	
CNG	
Total	

1 The teacher calls out the names of the fruits at random. Listen carefully and keep track of numbers with tally marks. And after that convert tally marks into numeral characters to complete the table below.

Name of fruits	Tally marks	Number
Orange		
Banana		
Apple		
Guava		
Total		



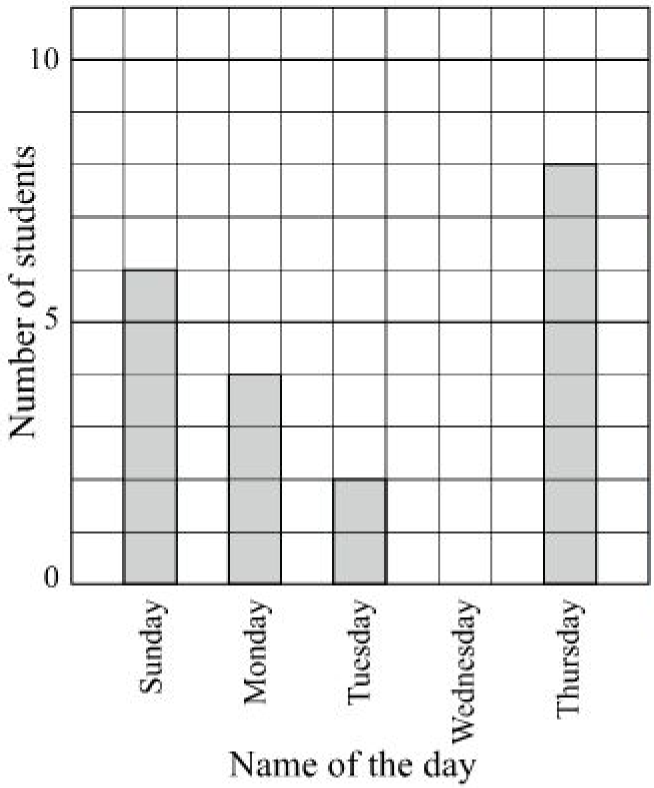
12.2 Display with a Bar Diagram

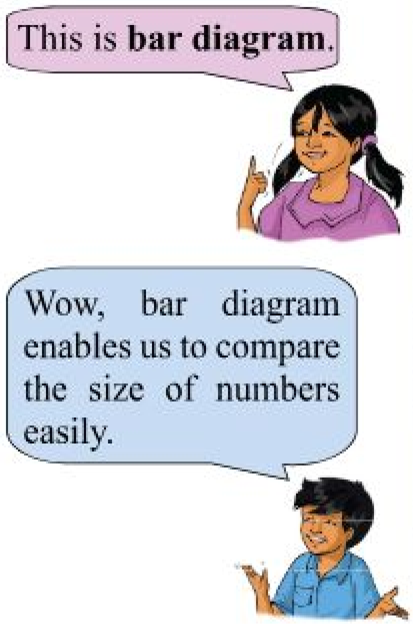
Let's try to display the data on a bar diagram.

The number of absentees of class A in different days of the week is given in the table on the right and on the **bar diagram** below. Let's find how to read them.

Day	Number of absent students
Sunday	6
Monday	4
Tuesday	2
Wednesday	0
Thursday	8
Total	20

The number of absentees of class A



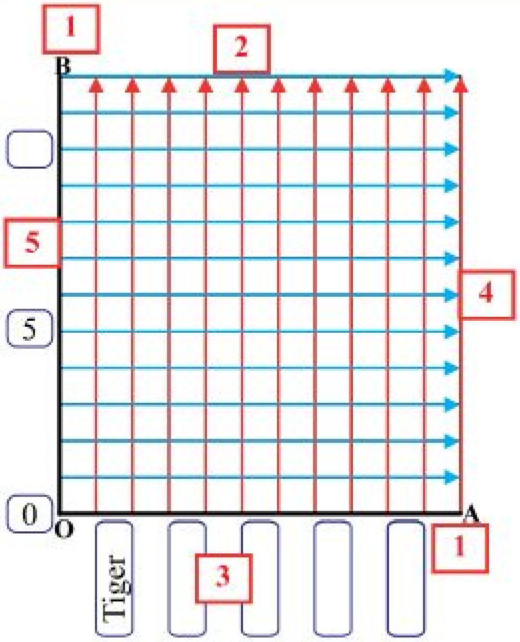


(1) What is the title of the bar diagram?
(2) How many students does one mark on the vertical scale represent?
(3) On which day were most of the students absent?
(4) On which day were all students present?

The table on the right shows the animals liked by Mita's classmates. Draw the bar diagram.

Animals	Number of students
Tiger	9
Elephant	11
Hippopotamus	4
Lion	7
Leopard	3
Total	34

How to draw a bar diagram



Step 1: Draw a horizontal line **OA** and a vertical line **OB**.

Step 2: Draw some vertical lines on **OA** keeping equal space between them. The number of lines should be more than the number of animals.

Step 3: Write the name of the animals below between two vertical lines following the figure.

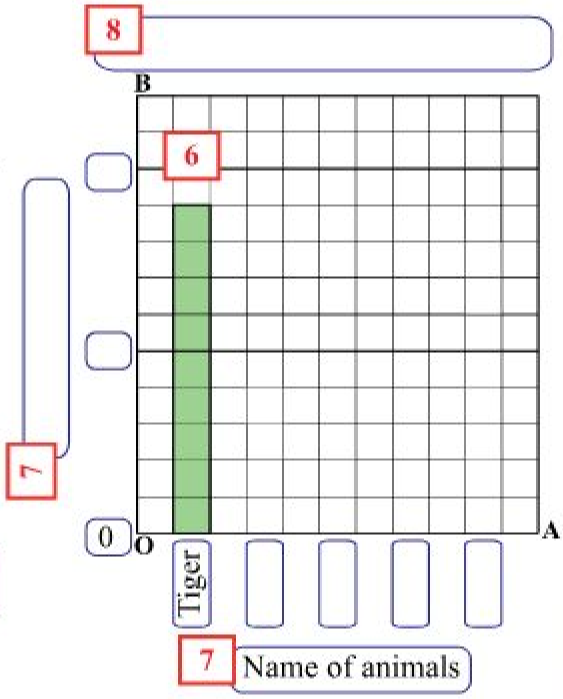
Step 4: Draw some horizontal lines on **OB** keeping equal space between them. The number of lines should be more than the number of students.

Step 5: Fix a scale for the number of student on **OB** (like 0, 5 and 10 tudents)

Step 6: Draw bars on **OA** for each animal according to the number of students' liking.

Step 7: Write title of horizontal axis as "name of animals" and vertical axis as "number of students"

Step 8: Now write the title of the bar diagram as "Favourite animals of the student"





12.3 Exercise

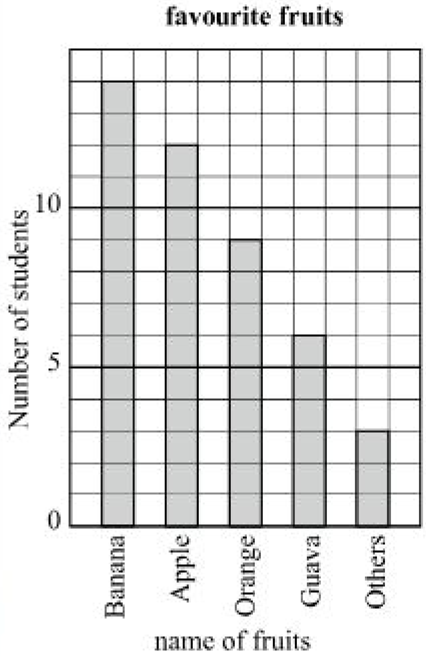


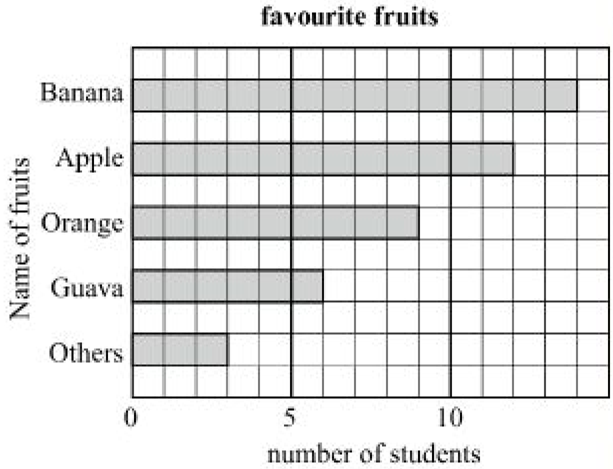
1. This is the memo of the sales of various vegetables in a shop. Write the total amount of every vegetables in numeral characters.

Vegetables	Tally marks	**Total**
Lemon	卌 卌 卌 卌 卌 卌 卌 卌 卌 |||	
Cabbage	卌 卌 卌 卌 卌 ||	
Cauliflower	卌 卌 卌 卌 卌 卌 卌	
Pumpkin	卌 卌 ||||	
Total		

2. Draw a bar diagram titled 'number of the vehicles' using the data in P.139.

3. Compare these two diagrams. Can we say both of two are bar diagram? Talk freely with your friends and give your opinion.





2025

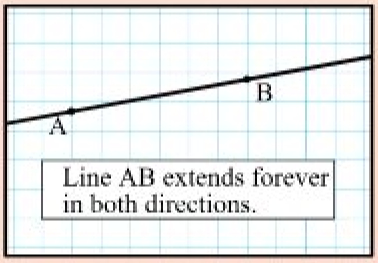
Chapter Thirteen

Lines and Angles

13.1 Lines

Let's learn about the lines and the relation among them.

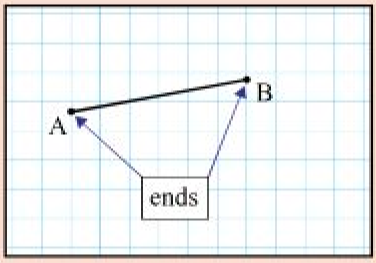
A **straight line** is:
- Straight (no curves)
- Endless (extends in both directions without end)
- has no thickness



To show the endlessness we can draw a **straight line** like this: 



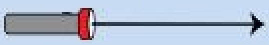
If it does have ends, it is:
A **line segment**.

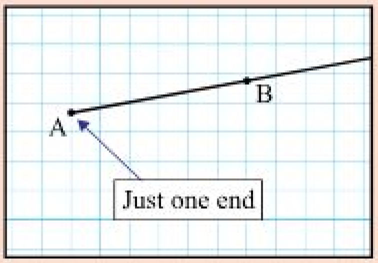


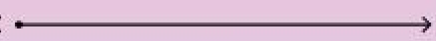
If it has just one end, it is:
A **Ray**.



Just like a…ray.



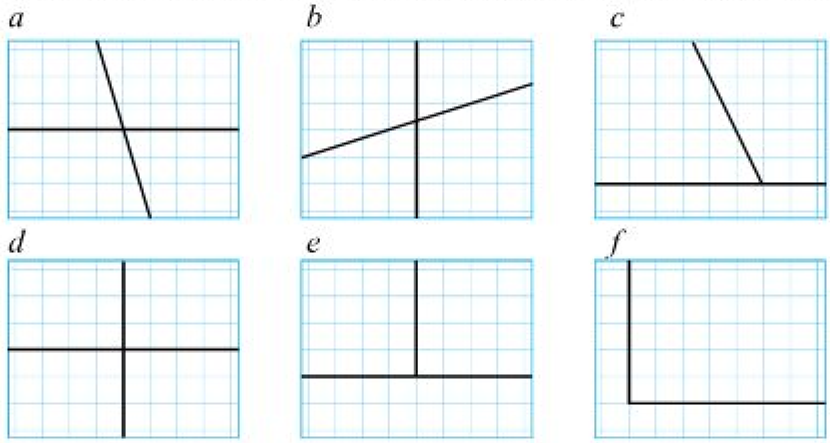


To show the endlessness of one side, we can draw a **ray** like this: 



2025

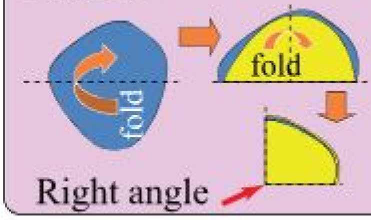
Let's learn about how lines meet or intersect with each other.





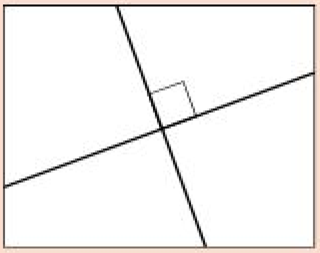
In the diagram *d*, *e* and *f*, lines meet or intersect at a **right angle**.

We learned right angle in Grade 3.



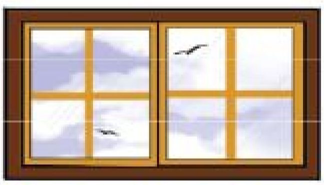


A line is **perpendicular** to another if it meets or intersects it at right angle.



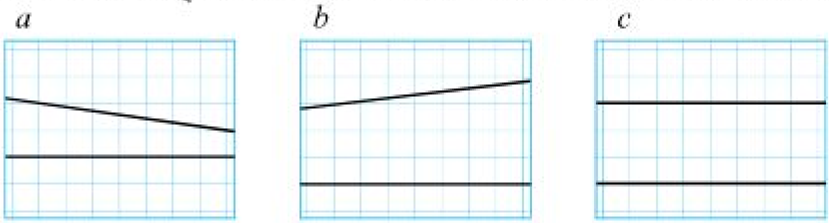
The lines in the diagram d, e, and f, are **perpendicular** lines.

1 Look for perpendicular lines around you.





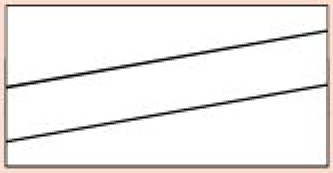
Are there any lines which don't meet or intersect with each other?

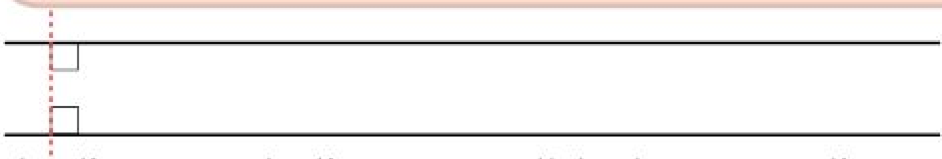




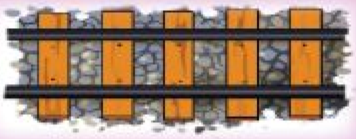
In the diagram *a* and *b*, two lines get closer to each other and they will intersect.

Lines are **parallel** if they are always the same distance apart and never meet.





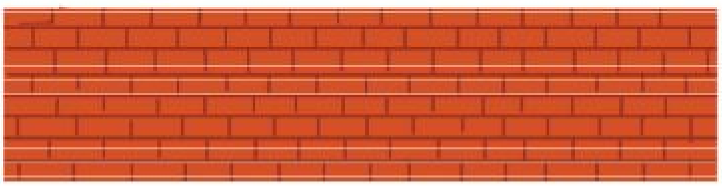
In the diagram *c*, the lines are parallel. The **parallel** lines are both perpendicular to the same line, and no matter how far you extend them, they will never intersect.



We can imagine two straight rail lines as a model of parallel lines.



1 Look for parallel lines around you.

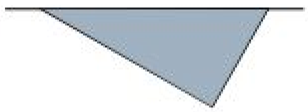


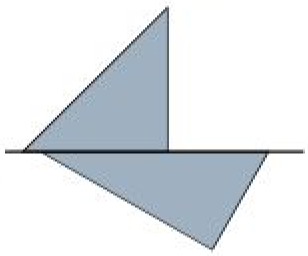


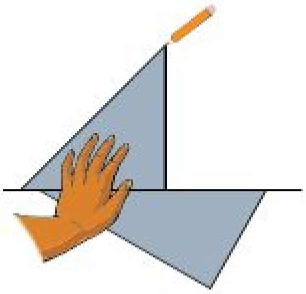
Let's draw **perpendicular** and **parallel lines** with set squares.

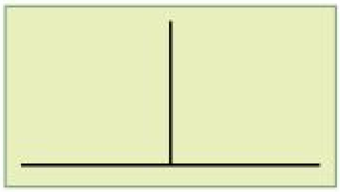
Perpendicular lines

1

2


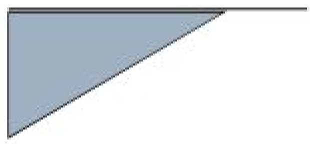
3


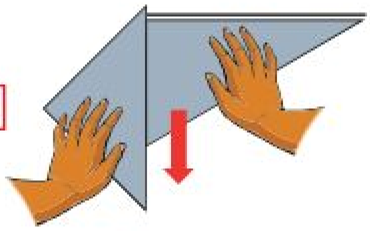
4


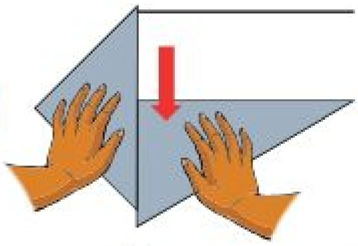
5


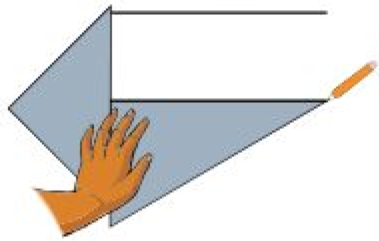
Parallel lines

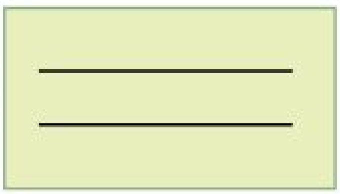
1

2


3


4


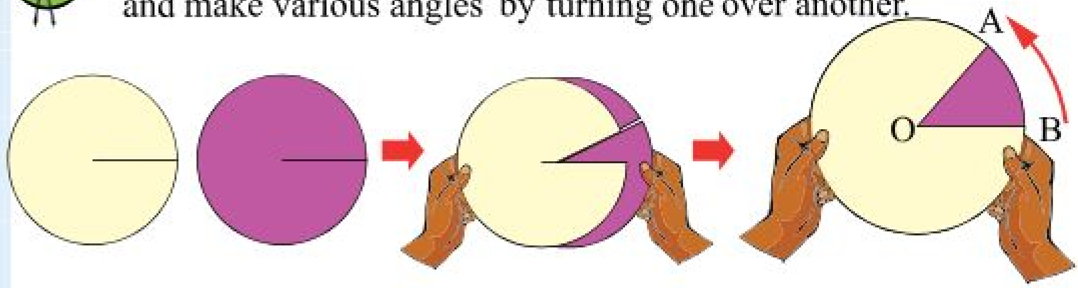
5


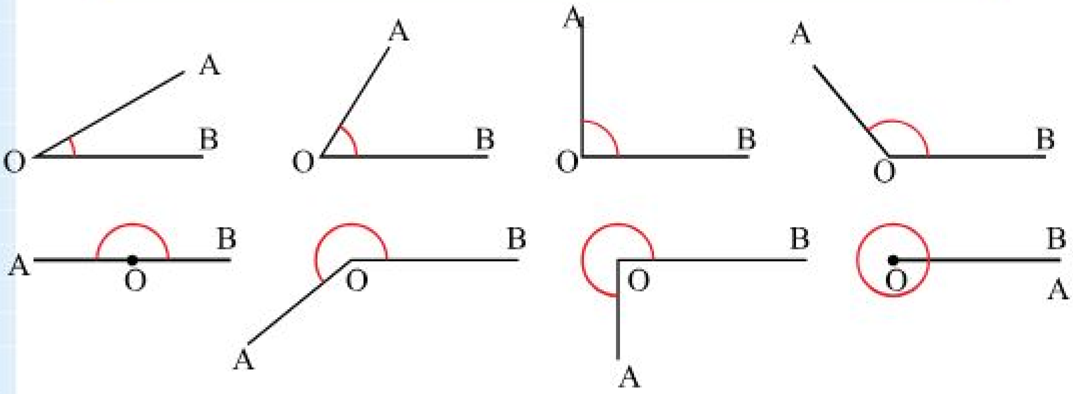
6


13.2 Angle

Let's find the size of the angles and draw them.

Let's take two circles made of thick paper like the following and make various angles by turning one over another.







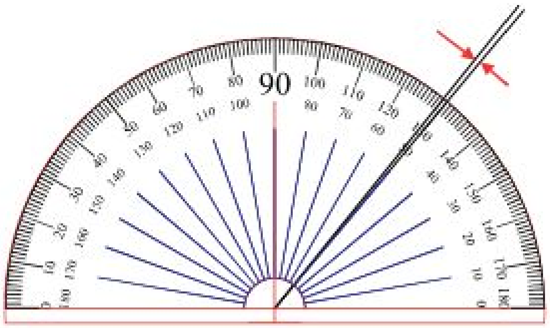
The size of the angle is not related to the length of the lines making the angle, but to the extent they are open.

It would be convenient if we could express the size of angles by using numbers like length, area, volume and weight.



The unit for measuring the size of angles is **degree**, and '°' is used to show it. The size of the angle indicates its measurement.

We use a **protractor** to measure the size of angles.

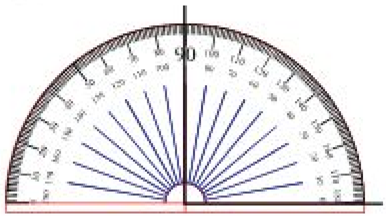


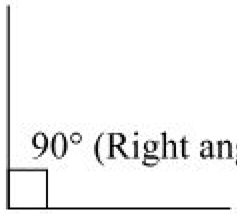
1° (1 degree)

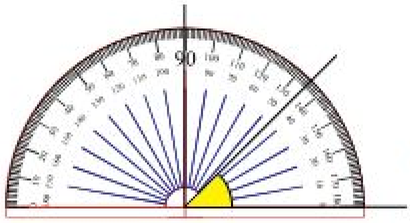
1° × 90 = right angle.
Right angle = 90°



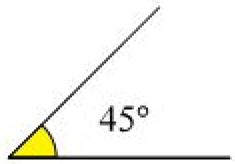
Let's observe some typical angles by dividing 90°.

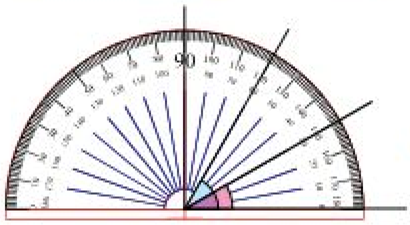




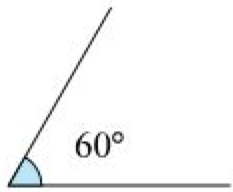


$\frac{1}{2}$ of 90°

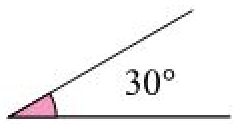




$\frac{2}{3}$ of 90°

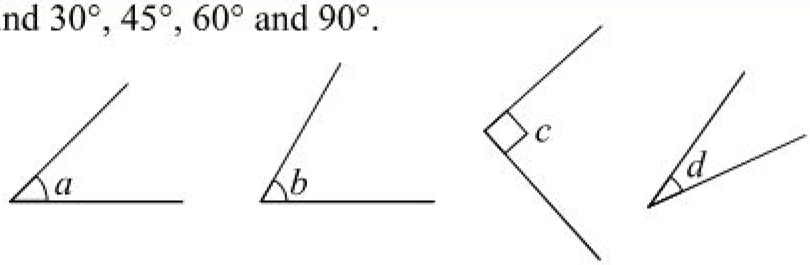


$\frac{1}{3}$ of 90°

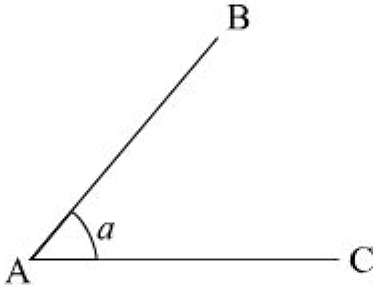


(These angles are 90°, 45°, 60° and 30°)

1 Find 30°, 45°, 60° and 90°.



2 Now use a protractor to find the size of the angle a .

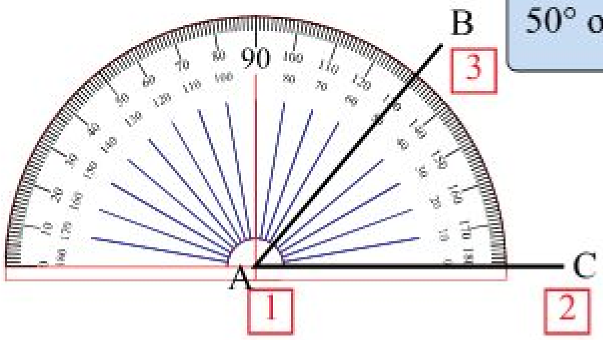


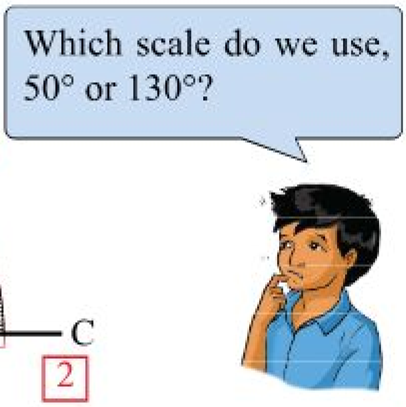
Angle *a* can be written as $\angle a$, or $\angle$BAC (read as angle CAB).

1 Place the central point of the protractor at vertex A.

2 Match the AB side with the 0° sign of the protractor.

3 Read the scale mark that mingles with the AC side.

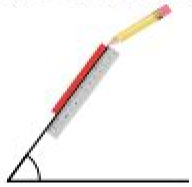




The size of angle of *a* is 50°. ($\angle a$=50°or $\angle$CAB =50°)

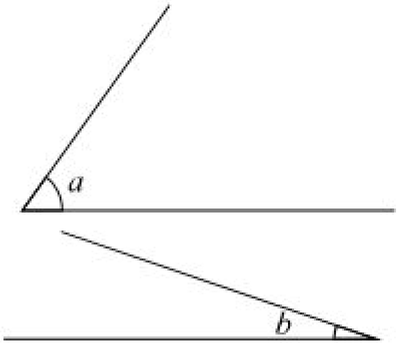
2 Measure the size of the angles.

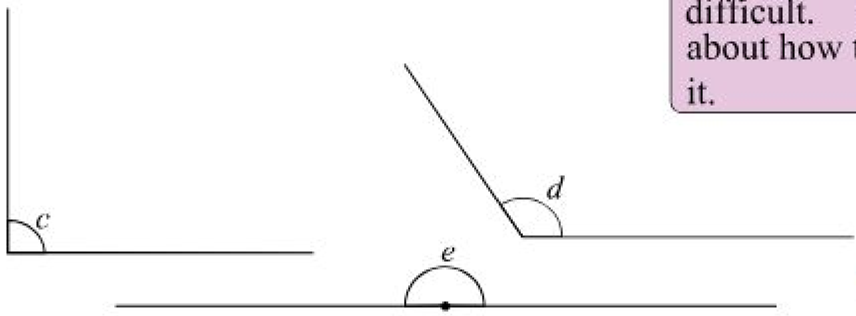
If the side of an angle is too short to measure, you can extend it.





How do we measure b?





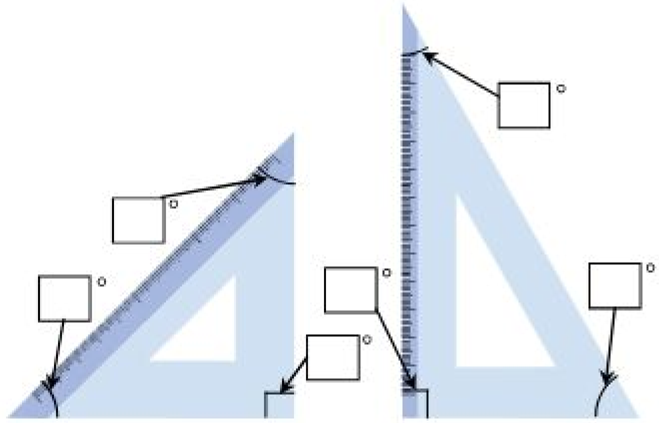
I don't think it's so difficult. Let's think about how to measure it.



We can read degrees of the protractor from left to right as well.

∠e is 180°. It is called **straight angle** .

3 Measure the size of the angles on a set square.



4 Draw an angle with a size of 50°.

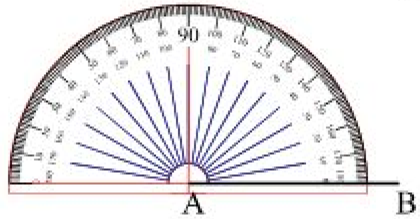
Can we also use a protractor to draw angles?



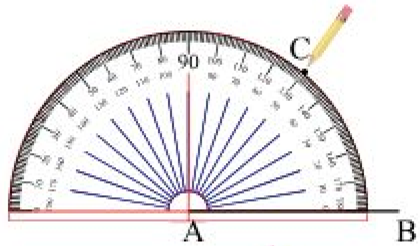
1 Draw a straight line AB.



2 Place the central point of the protractor at the point A, and match line AB with the 0° line.

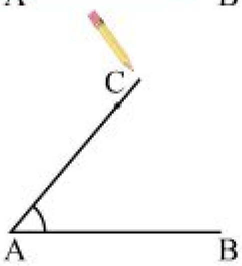


3 Draw a point C at the 50° scale mark.



4 Take the protractor away and draw a line with a ruler from the point A to the point C.

5 ∠CAB is 50°



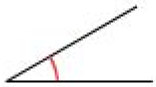
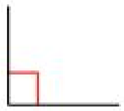
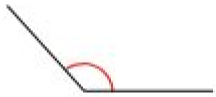
3 Draw angles of the following sizes with a protractor.

(a) 30° (b) 75° (c) 90° (d) 135° (e) 180°



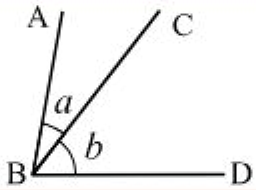
Now we can measure and draw angles.
Let's learn more about angles.

The angles can be classified as shown below:

angle	size	name
	smaller than 90°	**acute angle**
	90°	**right angle**
	larger than 90° and smaller than 180°	**obtuse angle**
	180°	**straight angle**

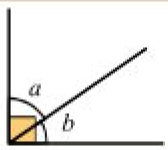
The relation of angles can be expressed as shown below.

When two angles have a common side and a common vertex, and don't overlap, they are **adjacent angles**.



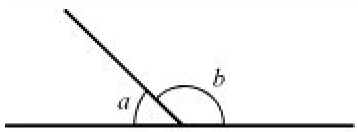
∠a and ∠b are **adjacent angles**.
Because: They have the common side, BC.
They have the common vertex, B.

When two angles add up to 90° (a right angle), they are **complementary angles**.



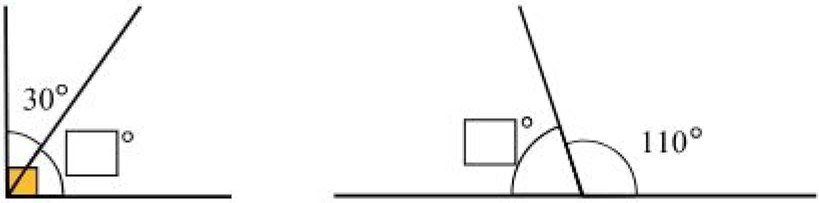
∠a and ∠b are **complementary angles**.
Because: They add up to 90°.

When two angles add up to 180° (a straight angle), they are called **supplementary angles**.

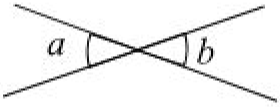


∠a and ∠b are **supplementary angles**.
Because: They add up to 180°.

4 Find hidden angles.



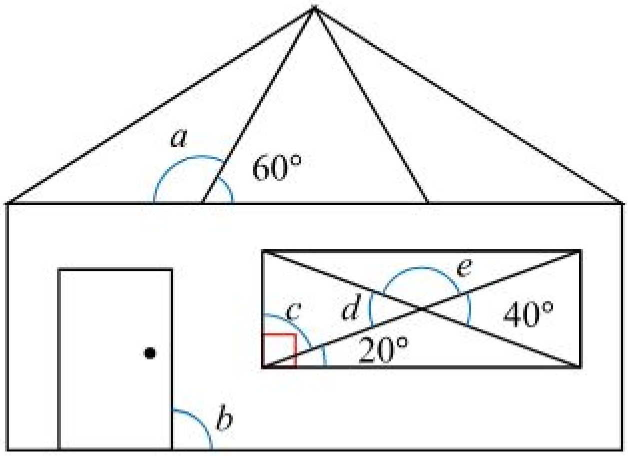
Vertically opposite angles are the angles opposite each other when two lines cross.



$\angle a$ and $\angle b$ are **vertically opposite angles.** The interesting thing is that vertically opposite angles are mutually equal.

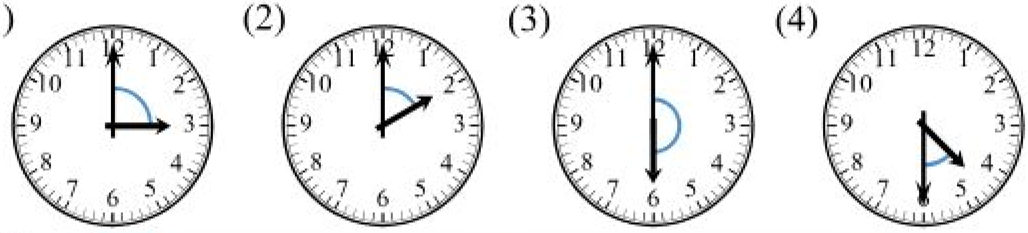
$\angle \boldsymbol{a} = \angle \boldsymbol{b}$

5 Find $\angle a$, $\angle b$, $\angle c$, $\angle d$ and $\angle e$ without measuring the angles.



6 Identify the angle formed by the long hand and the short hand of the clock.

(1) (2) (3) (4)



13.3 Exercise

1. Give names to the following angles.



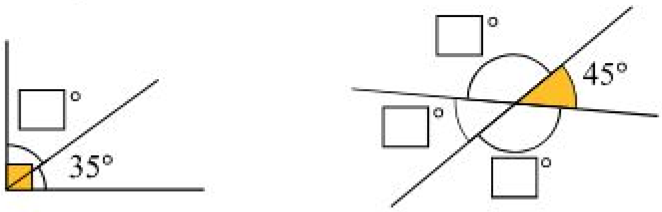
2.Measure the following angles with a protractor.



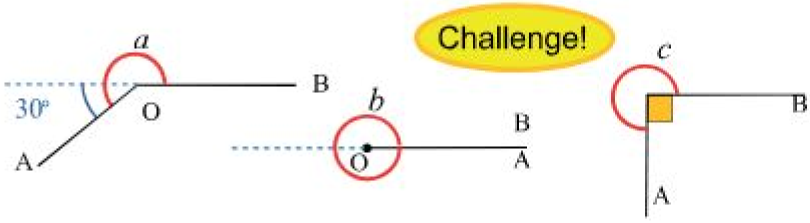
3. Draw following angles with a protractor.

ⓐ 25° ⓑ 175° ⓒ 90° ⓓ 180°

4. Find the hidden angles.



5. Find the size of the following angles.



6. Explain what are **parallel** and **perpendicular** in words.

Chapter Fourteen

Triangle

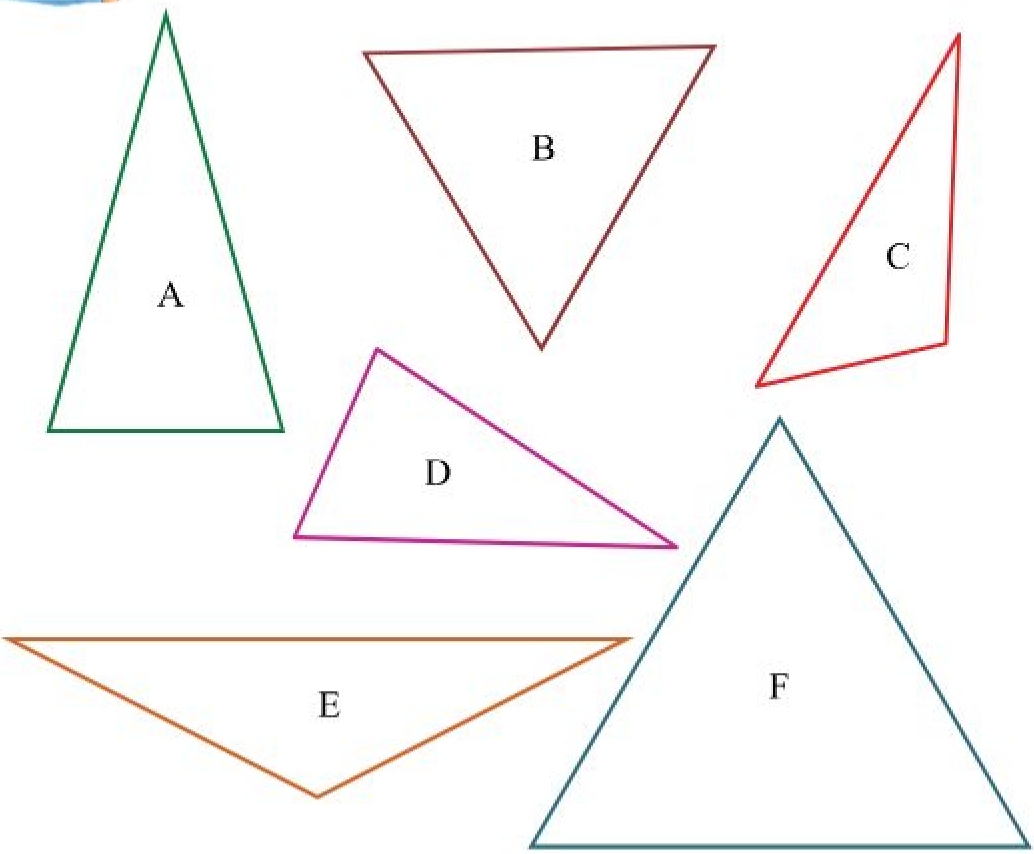
14.1 Triangles

Let's learn the characteristics of triangles.

Let's sort out the triangles according to the length of their sides.

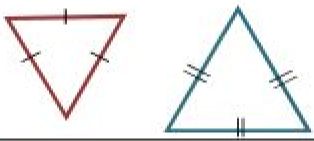
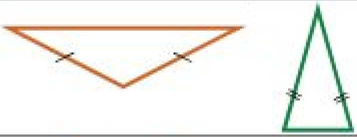
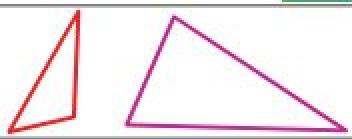


By measuring the length of the sides with a ruler, estimate the characteristics of the triangles.

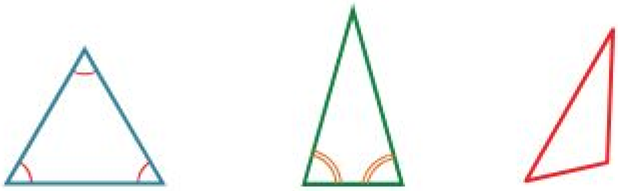


Triangle based on the sides :

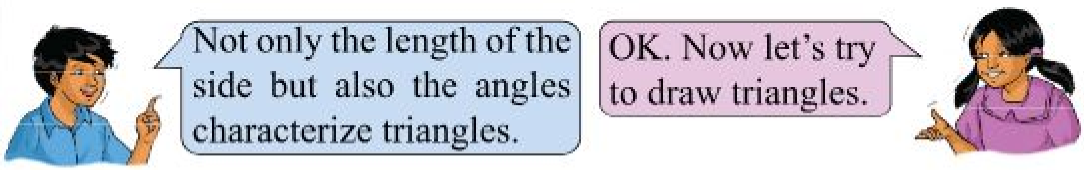
A triangle is given three names based on how many sides of that tringle are equal.

Three equal sides		**Equilateral Triangle**
Two equal sides		**Isosceles Triangle**
No equal sides		**Scalene Triangle**

Using a protractor, let's measure the size of each angle of the triangles on the previous page.



Equilateral Triangle has three equal angles, and they are always **60°**.
Isosceles Triangle has two equal angles.
Scalene Triangle has no equal angles.



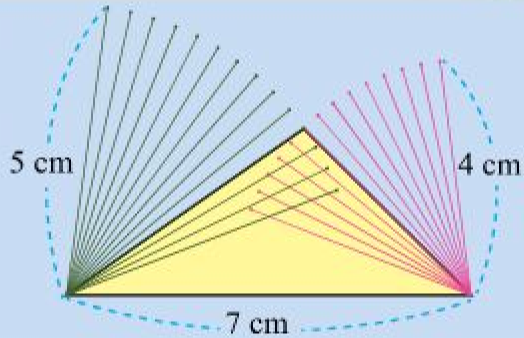
Draw a scalene triangle with the sides of 7cm, 5cm and 4cm.

Let's begin with drawing 7cm side.

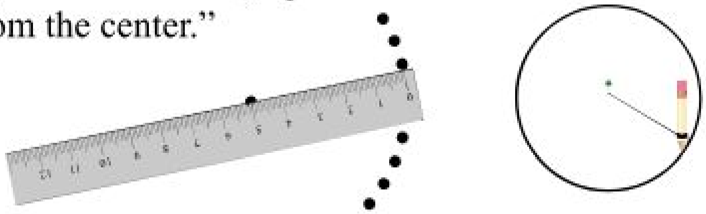


OK. But how can we draw the second and third sides? Is there any good way to find the meeting point of these sides?





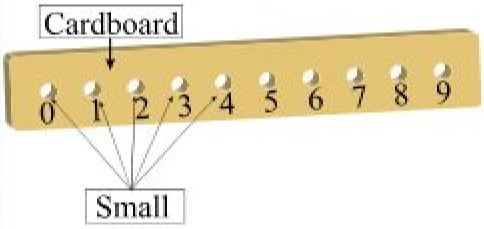
In the diagram above, the trace of the points of the sides is the same as a part of circles; in other words, "points which are located at the same distance from the center."

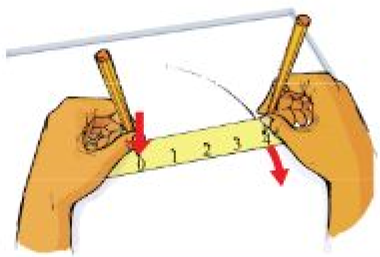




I remember we studied it in Grade 3.

In order to draw a part of a circle, we can make a scaled rectangular piece of cardboard with small holes like below, instead of using a board pin and thread like the illustration above.

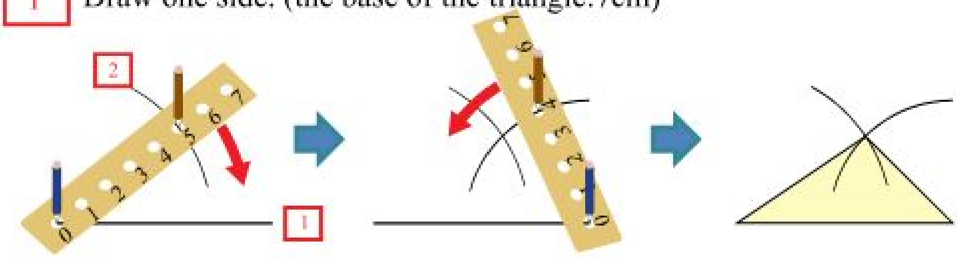




Now, let's draw the triangle.



1 Draw one side. (the base of the triangle:7cm)



2 Draw **5 cm** distance from the left side of the base.

3 Draw **4 cm** distance from the right side of the base.

4 Draw two sides using the point you've found.

Draw the following triangles with the method above.

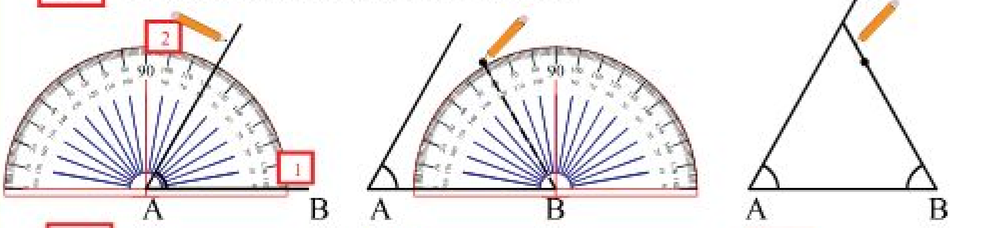
1. An equilateral triangle with sides of 6cm.
2. An isosceles triangle with sides of 5cm, 7cm and 7cm.

Equilateral Triangle has three **60°,** and **Isoscele** Triangle has two equal angles. Can we draw a triangle using these angles?



Draw an equilateral triangle with sides of 5cm.

1 Draw one side. (line AB:5cm)



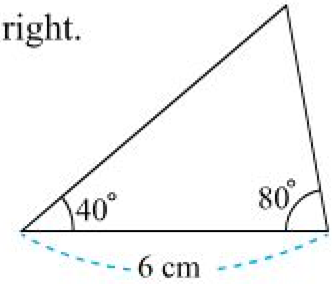
2 Draw an angle with a size of 60° by the method on page 151.

3 Find 60° from B.

4 Draw a line and adjust the length of the sides.

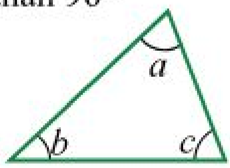
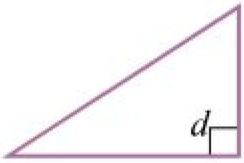
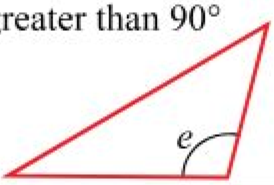
After drawing the equilateral triangle with sides of 5cm using the angles, make sure that the length of all the sides is the same and all the angles are 60°.

2 Draw the triangles as shown on the right.

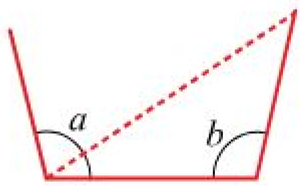


Triangles based on the angles

Triangles can also be named based on their angles.

All three angles are less than 90° (a, b and $c < 90°$) 	**Acute Angled Triangle**
One of the angles is 90° ($d = 90°$) 	**Right Angled Triangle**
One of the angles is greater than 90° ($e > 90°$) 	**Obtuse Angled Triangle**

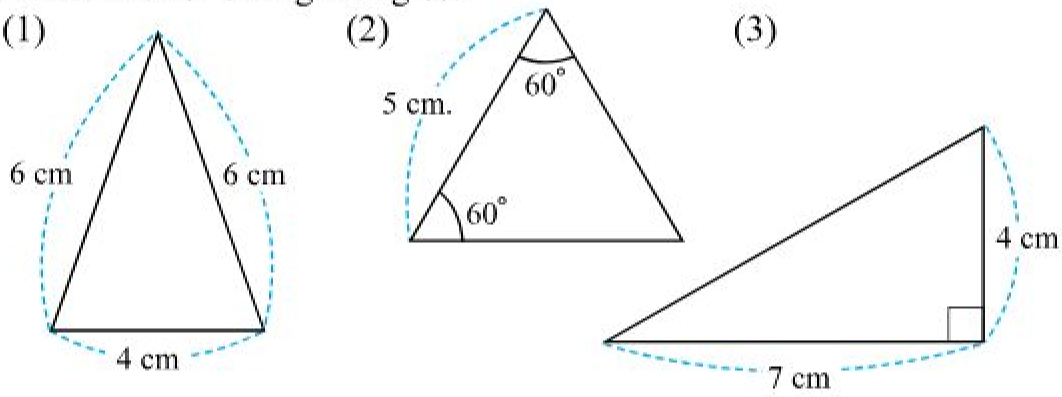
3 Are we able to darw an **Obtuse Angled Triangle** which has two obtuse angles? Let's explain the reason.



14.2 Exercise

1. Draw the following triangles.

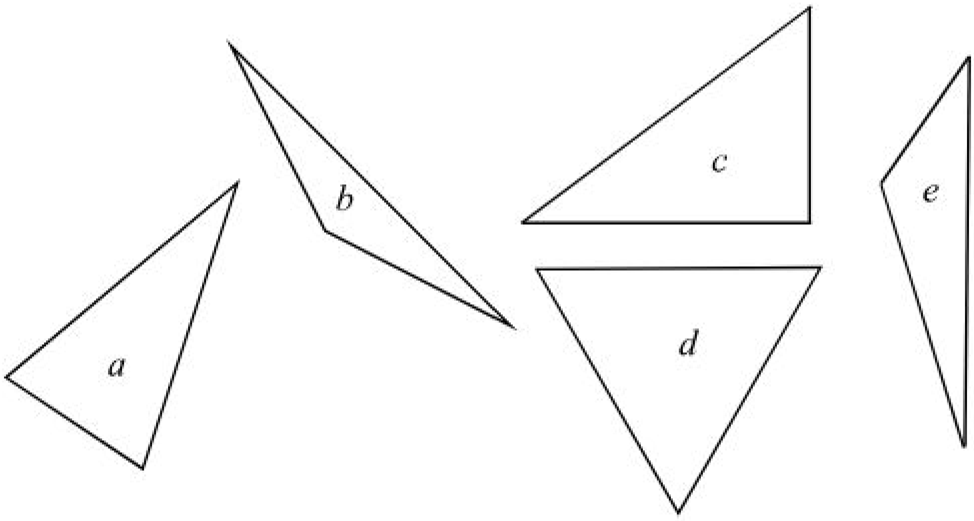
(1) (2) (3)



2. Answer the two kinds of names of the triangles above.

Classification	Triangle (1)	Triangle(2)	Triangle(3)
Based on the **sides**			
Based on the **angles**			

3. Group these triangles and talk about grouping in the classroom.



Answers

Chapter 1:

Exercise-(1) Page-10

1. Do yourself **2.** (1) 45,000; Forty five thousand (2) 1,00,00,000; One crore (3) 10,00,000; Ten lac (4) 1,27,000; One lac twenty seven thousand (5) 10,11,010; Ten lac eleven thousand and ten **3.** Do yourself **4.** (1) 1,35,24,689 (2) 97,57,834 (3) 5,55,55,555 **5.** (1) A. 1500 B. 3000 C. 4900 (2) A. 90,000 B. 93,000 C. 1,00,000 D. 1,07,000

Exercise-(2) Page-18

1. (1) < (2) > (3) < (4) < (5) = (6) > **2.** (1) 9,86,420 (2) 2,04,689 (3) 8,64,209 (4) 2,04,689 **3.** 371993-886397-2456891-3704231-4589476, highest population: D, lowest population: A.

Chapter 2:

Exercise- Page-32

1. (1) 68,889 (2) 80,194 (3) 73,921 (4) 90,000 (5) 69,989 (6) 80,420 (7) 83,094 (8) 96,006 (9) 3,810 (10) 34,518 (11) 60,909 (12) 1,607 (13) 80,306 (14) 5,894 (15) 22,222 (16) 99,991 **2.** (1) 55,101 (2) 1,240 **3.** (1) 10,000 (2) 2,426 (3) 28,500 **4.** 32,955 sacks **5.** 2,043 **6.** 4,572 **7.** 8,126 **8.** 33,710 **9.** Gita: 420 taka, Shihab 810 taka **10.** 3,995 boys **11.** 17,700 taka **12.** 2,029 years old.

Chapter 3:

Exercise- Page-42

1. (1) 7,520 (2) 1,000 (3) 45,300 (4) 10,000 (5) 3,770 (6) 63,272 (7) 35,280 (8) 64,960 (9) 31,668 (10) 6,240 (11) 31,784 (12) 98,472 (13) 65,626 (14) 98,331 (15) 88,803 (16) 62,321 (17) 43,010 (18) 86,328 (19) 83,804 (20) 87,969 **2.** (1) 15,616 (2) 19,278 (3) 18,240 (4) 49,500 (5) 1,57,800 (6) 2,46,000 **3.** (1) 91,200 (2) 91,200 (3) 9,12,000 **4.** (A) wrong-143 × 6; right- 143 × 60; right answer 8866 (B) 0 of multiplicand is not multiplied; right answer 74783 **5.** Do yourself. **6.** 10,000 taka. **7.** 18,500 tickets **8.** 3,125 taka **9.** 3,450 m **10.** 1,980 taka **11.** 50,875 taka **12.** 74,490 pieces.

Chapter 4

Exercise- Page-56

1. (1) 2 (2) 2 remainder 10 (3) 8 (4) 7 remainder 30 (5) 3 (6) 2

(7) 2 remainder 1 (8) 3 remainder 15 (9) 4 (10) 6 remainder 17 (11) 8 (12) 5 remainder 6 (13) 31 (14) 43 remainder 3 (15) 21 remainder 25 (16) 30 remainder 14 (17) 215 (18) 216 remainder 6 (19) 93 (20) 291 remainder 4 **2.** (1) 38 (2) 8 (3) 100 (4) 14 **3.** Do yourself. **4.** 112 **5.** 9 groups **6.** 7 postcards **7.** 41 boxes, 8 pencils **8.** 22 m **9.** 27 taka **10.** 28 garlands.

Chapter 5

Exercise- Page-65

1. (1) 53 (2) 35 (3) 25 (4) 7 **2.**(1) 824 (2) 524 (3) 66,000 (4) 9,200 (5) 800 (6) 776 **3.** (1) 108 taka (2) 146 (3) 3,000 taka **4.** Moni 500 taka, Rupa 375 taka **5.** father 44 years old, son 11 years old. **6.** 96 taka **7.** Do yourself.

Chapter 6

Exercise- Page-72

1. (1) > (2) = (3) = **2.**(1) true (2) true (3) false (4) false **3.** (1) −, × (2) +, − (3) ×, ÷ (4) −, × **4.** (1) 25 (2) 8 (3) 9 (4) 4

5. (1) $\square \div 7 = 5$ remainder 4, $\square = 39$ (2) $7\times(\square+3) = 56$, $\square = 5$

Chapter 7:

Exercise- Page-85

1. (1) 4, 8, 12 (2) 7, 14, 21 (3) 11, 22, 33 (4) 14, 28, 42 **2.** (1) 12, 24, 36; LCM 12 (2) 36, 72, 108; LCM 36 (3) 9, 18, 27; LCM 9 (4) 40, 80, 120; LCM 40 **3.** (1) 1, 3, 9 (2) 1, 2, 3, 4, 6, 12 (3) 1, 2, 3, 4, 6, 8, 12, 24 (4) 1, 2, 3, 5, 6, 10, 15, 30 **4.** (1) 1, 3 HCF:3 (2) 1, 7 HCF:7 (3) 1, 2, 4, 8, HCF:8 (4) 1 HCF:1 **5.** (1) LCM 24, HCF 4 (2) LCM 36, HCF 3 **6.** Do yourself **7.** (1) 248, 460, 912, 810 (2) 339, 912, 555, 810, 951 (3) 515, 460, 555, 810, 725 **8.** 12:24 p.m. **9.** 12 cm **10.** 35 cm **11.** 9 children; 5 apples, 2 oranges.

Chapter 8:

Exercise- (1) Page-94

1\. (1) $\frac{2}{3}$, $\frac{5}{8}$, $\frac{3}{9}$, $\frac{42}{48}$, $\frac{2}{25}$ (2) $\frac{4}{4}$, $\frac{1}{1}$, $\frac{76}{76}$, $\frac{3}{3}$

2\. (1) $\frac{2}{7} < \frac{3}{7} < \frac{6}{7} < \frac{7}{7}$ (2) $\frac{4}{11} < \frac{4}{9} < \frac{4}{7} < \frac{4}{5}$ (3) $\frac{11}{91} < \frac{11}{23} < \frac{11}{17} < \frac{11}{13}$

2025

3. (1) 2 (2) 12 (3) 27 (4) 15 (5) 72 (6) 48 (7) 1 (8) 3 (9) 7 (10) 2 (11) 13 (12) 9

4. (1) $\frac{1}{2}$ (2) $\frac{1}{7}$ (3) $\frac{1}{4}$ (4) $\frac{1}{3}$ (5) $\frac{2}{3}$ (6) $\frac{3}{4}$ (7) $\frac{4}{5}$ (8) $\frac{8}{9}$ (9) $\frac{3}{5}$ (10) $\frac{4}{7}$ (11) $\frac{4}{7}$ (12) $\frac{3}{5}$

Exercise- (2) Page-101

1. (1) > (2) < (3) > (4) = (5) > **2.** (1) $\frac{3}{4}$ (2) $\frac{29}{35}$ (3) $\frac{13}{24}$ (4) $\frac{16}{21}$ (5) $\frac{23}{36}$ (6) $\frac{14}{15}$ (7) $\frac{4}{5}$ (8) $\frac{3}{10}$ (9) $\frac{2}{3}$ (10) $\frac{3}{4}$ **3.** (1) $\frac{1}{12}$ (2) $\frac{13}{30}$ (3) $\frac{1}{6}$ (4) $\frac{5}{18}$ (5) $\frac{5}{36}$ (6) $\frac{1}{2}$ (7) $\frac{1}{3}$ (8) $\frac{1}{10}$ (9) $\frac{1}{5}$ (10) $\frac{1}{15}$ **4.** (1) $\frac{2}{3}$ (2) $\frac{13}{18}$ (3) $\frac{1}{18}$ (4) $\frac{13}{20}$ **5.** (1) 2 (2) 1 (3) 2 **6.** (1) $\frac{19}{24}$ km (2) Sabuj's; $\frac{1}{24}$ km

7. (1) $\frac{19}{20}$ part (2) $\frac{1}{20}$ part.

Chapter 9:

Exercise- (1) Page-110

1. (1) < (2) < (3) > (4) > (5) = (6) > (7) = (8) = **2.** (1) 1 (2) 1.3 (3) 1.3 (4) 2 (5) 0.3 (6) 0.8 (7) 0.9 (8) 1.6 **3.** (1) 4.8 (2) 4.3 (3) 8.6 (4) 9.8 (5) 8 (6) 2.1 (7) 2.2 (8) 6 (9) 0.8 (10) 0.2 **4.** (1) 17.2 km (2) 0.8 km

Exercise- (2) Page-120

1. Do yourself **2.** (1) 31 (2) 296 (3) 1,047 (4) 1,030 **3.** (1) 6, 0.06 (2) 4.9, 0.049 (3) 11.1, 0.111 (4) 73.2, 0.732 **4.** (1) 4.81 (2) 8.08 (3) 7.8 (4) 3.21 (5) 4 (6) 3.19 (7) 7.95 (8) 1.83 (9) 8.58 (10) 1.07 **5.** (1) 0.12 (2) 0.34 (3) 0.75 (4) $\frac{3}{5}$ (5) $\frac{1}{4}$ (6) $\frac{3}{40}$ **6.** 3.68 °C **7.** (1) 5.301 (2) 0.135

Chapter 10:

Exercise- (1) Page-126

1. (1) 0.8 cm (2) 4,200 m (3) 5,450 ml , 54.5 dl (4) 307 cm (5) 0.6 kg **2.** 216.2 cm, 2.162 m **3.** 0.605 kg, 605 g **4.** 1,020 ml , 10.2 dl and 1.02 L **5.** 2.35 km and 2350 m.

Exercise- (2) Page-133

1. (1) 8 cm^2 (2) 25 cm^2 (3)18 cm^2 **2.** 28 m. **3.** (1) 40,000 cm^2 (2) 30,000 cm^2 (3) 10,00,000 m^2 (=1km^2) **4.** (A) 2250 cm^2 (B) 320 m^2 (C) 200 km^2

Chapter 11:

Exercise- Pagr-137

1. 4 min. = 240 (seconds) 12 min. = 720 (seconds) 10 min. = 600 (seconds) 5 min. = 300 (seconds) 20min. = 1200 (seconds) **2.** 72 hours = 3 (days) 120 hours = 5 (days) 2 weeks = 14 (days) 3 weeks = 21(days) 4 weeks = 28 (days) **3.** 70 minutes/1 hour and 10 minutes, 140 minutes/2 hours and 20 minutes, 135 minutes/2 hours and 15 minutes, 180 minutes/3 hours **4.** 1 year 3 months **5.** 1 month 3 days.

Chapter 12:

Exercise- Page-142

1. 48, 27, 35, 14 **2-3.** Do yourself.

Chapter 13:

Exercise- Page-154

1. a. obtuse angle b. right angle c. straight angle d. acute angle **2.** a=15° b=107° **3.** Do yourself. **4.** 55°, 135°/45°/135° **5.** a. 210° b. 360° c. 270° **6.** Do yourself.

Chapter 14:

Exercise- Page-160

1. Do yourself **2.** Triangle (1) isosceles, acute; Triangle (2) equilateral, acute; Triangle (3) scalene, right angled **3.** Do yourself

End

Academic Year 2025, Class Four–Math

Time and tide wait for none.

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Call **109** (Toll free, 24 hours) National Help Centre to redress and prevent violence against women and children.

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